

*January • 1956*

# finish

THE MAGAZINE OF  
*Appliance* AND  
Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

TP 785  
F-49  
v-13.

# You Can Depend on "Ceramic" Quality and Service

## FOR POTTERY COLORS

Glaze Stains; Body and Engobe Stains; Underglaze and Overglaze Colors for Banding, Spraying and Screening; Decalcomania Colors; Art Glazes; Fritted Glazes; Frits and Fluxes; Liquid Bright and Burnish Gold.

## FOR GLASS COLORS

Vitrifiable Colors for Banding, Spraying and Screening; Alkali Resisting Colors; Weather Resisting Enamels; White Enamels; Satin Matt Finish Colors; High Fire Convexing Colors; Low Fire Colors; Printing Colors; Batch Colors; Crystal and Colored Ices; Liquid Bright Gold.

## FOR ENAMEL COLORS

Color Oxides; Smelter Color Compounds; Screening Colors; Graining Colors; Stamping Colors; High Temperature Enamels.

## FOR SUPPLIES

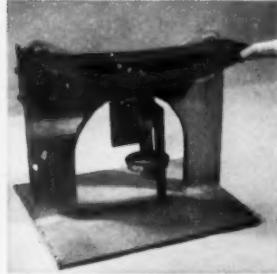
Screening Oils, French Fat Oil, Oil of Copiba, Balsam Copiba, Balsam Fir; Decal Size; Decorating Brushes; Knives and Spatulas; Lining Blocks — Porcelain, High Density Alumina, and Silex; Porcelain and High Density Alumina Balls; French Flint Pebbles; Ball Mills — Laboratory and Production; Porcelain Jar Mills — Laboratory and Production; Paste Grinding Mills; Spray Equipment.

## FOR CHEMICALS

Aluminum Hydrate	Cadmium Carbonate	Cryolite	Red Lead	Nickel Sulphate	Sodium Silicate
Aluminum Oxide	Cadmium Sulfide	Dolomite	White Lead	Opxax	Sodium Silico Fluoride
Ammonium	Calcium Carbonate	Epsom Salts	Litharge	Potassium Bichromate	Strontrium Carbonate
Metavanadate	Chromium Oxide	Feldspar	Lithium Compounds	Potassium Carbonate	Superpax
Antimony Oxide	Clay, Ball and China	Flint	Magnesite	Potassium Nitrate	Talc
Antimony, Black Needle	Cobalt Carbonate	Fluorspar	Magnesium Carbonate	Potassium Silico Fluoride	Tin Oxide
Arsenic Oxide, White	Cobalt Compounds	Gum Arabic	Manganese Dioxide,	Powder Blue	Tungstic Acid
Barium Carbonate	Cobalt Nickel Compounds	Gum Tragacanth	Fractionated and Powdered	Pyrophyllite	Titanium Dioxide
Berium Chromate	Cobalt Oxide	Iron Chromate	Molybdenum	Rutile, Powdered	Urea Crystals
Bentonite	Cobalt Sulphate	Iron Chromite	Iron Oxide, Fractionated and Powdered	Selenium	Whiting, Cliffstone and Domestic
Bone Ash	Colemanite, Synthetic	Kryolith	Nepheline Syenite	Soda Ash	Zinc Oxide
Borax	Copperas	Lead Bisilicate	Nickel Oxide, Grey	Sodium Antimonate	Zircon, Milled
Boric Acid	Copper Carbonate	Lead Chromate	Nickel Oxide, Black	Sodium Bichromate	Zircopax
	Copper Oxide	Lead Monosilicate	Nickel Oxide, Fractionated	Sodium Fluoride	Zirconium Silicate
	Copper Sulphate			Sodium Nitrate	Zirconium Oxide



CERAMIC COLOR & CHEMICAL MFG. CO.  
New Brighton, Pa., U.S.A.



Comparison between the sag of plain steel (front) and Armco Enameling Iron (back) as result of firing at same temperature.

Each of the 584 porcelain enameled sections of this large globe resisted distortion during repeated firings at high temperatures to give the smooth finished appearance shown here. Measuring 29 feet in diameter, the globe is distinguished for its 21 colors of porcelain enamel, as well as for its size.

## **584 Porcelain Enameled Panels make smooth cover for world's largest globe**

This world's largest "globe" is a good example of the versatility of porcelain enamel and excellent uniformity of Armco Enameling Iron. The quarter-million-dollar structure is covered with 21 different colors on 584 porcelain enameled sections.

Enameling iron sections were formed and premounted to insure fitting before porcelain enameling. Between trial mounting and final assembly, these Armco Enameling Iron sections were fired many times at temperatures ranging from 1450 F to 1520 F—enough to melt some metals and severely warp many others. Yet they showed no distortion, and fitted perfectly when remounted in final assembly.

### **FOR YOUR PRODUCTS?**

If you make products that might benefit from the sales advantages of porcelain enamel, why not consider this life-

time finish the next time you redesign?

Experienced job enamelters are ready to work with you—not only on design problems but in the production of porcelain enameled parts. Just fill in and mail the coupon for complete information.

### **ARMCO STEEL CORPORATION**

776 Curtis Street, Middletown, Ohio

Send me the names of job enamelters  
We manufacture \_\_\_\_\_

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

## **ARMCO STEEL CORPORATION**

776 CURTIS STREET, MIDDLETOWN, OHIO



SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



## Party Dress for a "Jubilee Celebration" dryer

Dressed up and going places, is this sparkling, new, "Jubilee Celebration" line of Hamilton Dryers. Designed to celebrate the 75th anniversary of this pioneer firm, special attention was given to insuring a rich, lasting finish with highest resistance to moisture, chemicals and heat.

The answer? KEMCLAD®—the Sherwin-Williams white-for-life appliance finish that stays bright, clean and stain-free.

KEMCLAD Appliance Finishes are adaptable to individual drying and production line needs . . . provide the technical advantages of the most extensive laboratories in the world devoted to paint research. Investigate what these or other Sherwin-Williams developments can do for you. Contact The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio or Montreal, Canada.



Gold and black trim accentuates gleaming white KEMCLAD finish on new Hamilton Dryers.



**SHERWIN-WILLIAMS**  
INDUSTRIAL FINISHES

# January • 1956

VOL. 13 • NO. 1

**finish**

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Established January 1944

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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

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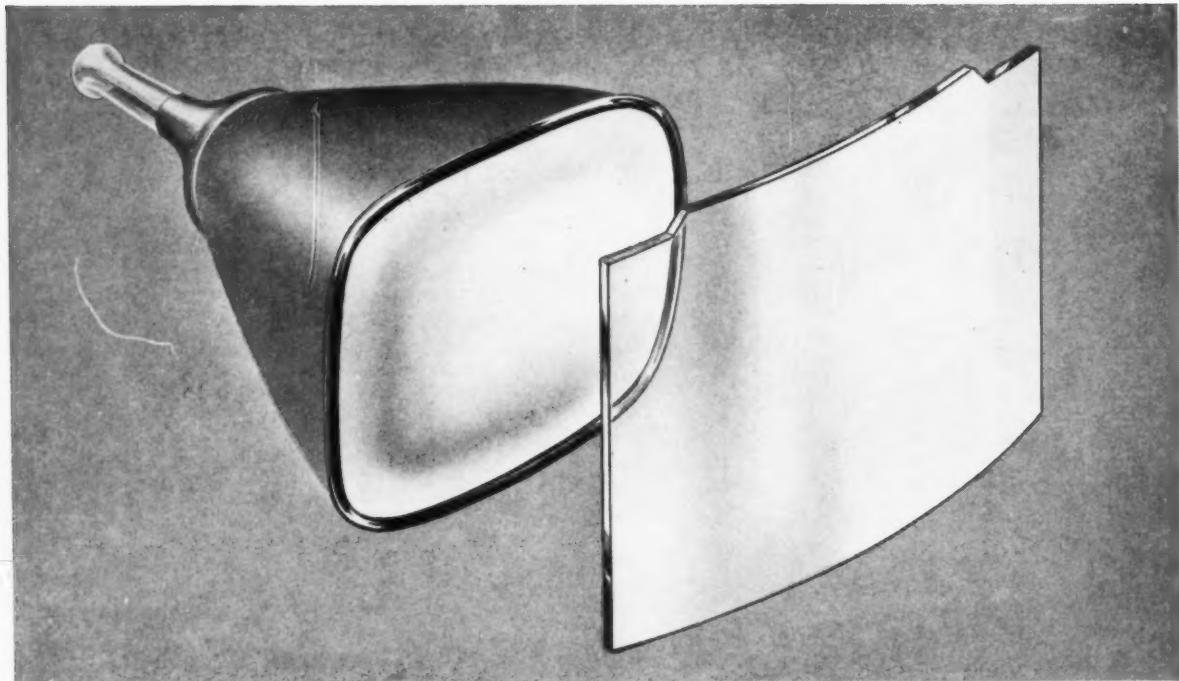
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**finish**

**METAL PRODUCTS MANUFACTURING**  
**FROM RAW METAL TO FINISHED PRODUCT**



# MARSCO

## precision glass parts

### FOR UTILITY AND BEAUTY

Glass — enhances the beauty and broadens the acceptance of your product whether in the utility appliance field or the growing electronic industry.

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Glass — flat as can be — precisely shaped to fit.

Glass — bent — convex — drilled — to the most exacting tolerance.

Glass — hardened, heat-treated or tempered to survive your consumer usage unscathed.

Join the major appliance manufacturers now enjoying extra sales from the appeal and prestige contributed thru the luster of glass — MARSCO'S Crystal Clear Glass.

Our engineers are experienced in incorporating glass as viewing windows in domestic appliances and television cabinets. A simple request to us solves your problem.



Bent Glass



Convex Glass



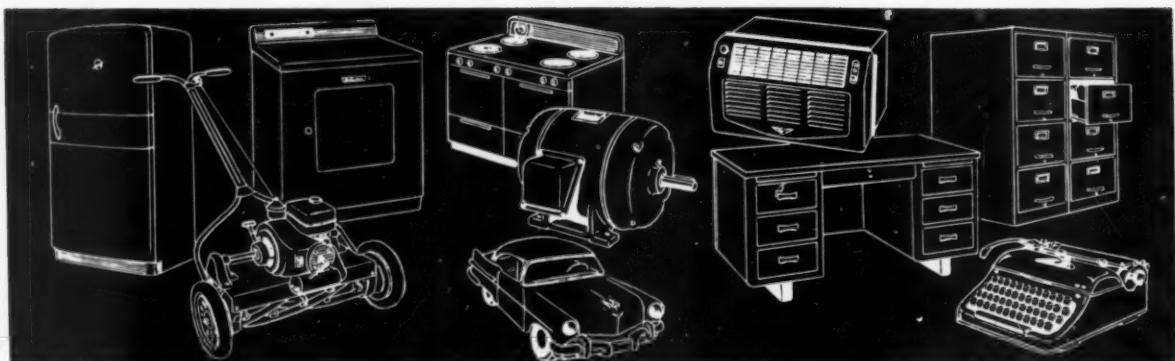
Heat-treated Glass

**MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.**



look...  
it's  
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The white coating on these venetian blinds was pigmented with TITANOX-RA—the rutile “pure” titanium dioxide white pigment. Because of its maximum hiding power, TITANOX-RA is especially useful in flexible thin films, on metallic surfaces. On products that must withstand bending or forming—containers, collapsible tubes, etc.—TITANOX-RA is your No. 1 choice in white pigments. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.



Southern Fasteners are precision built. Every screw or bolt is designed, manufactured, tested and inspected for Quality. Machine Screws in round, flat, oval, pan, filister binding, truss, and hex head styles; Phillips or slotted; Steel, Brass, Aluminum, Silicon Bronze, and Stainless Steel.

**BULK AND PACKAGED  
SHIPPED PROMPTLY**

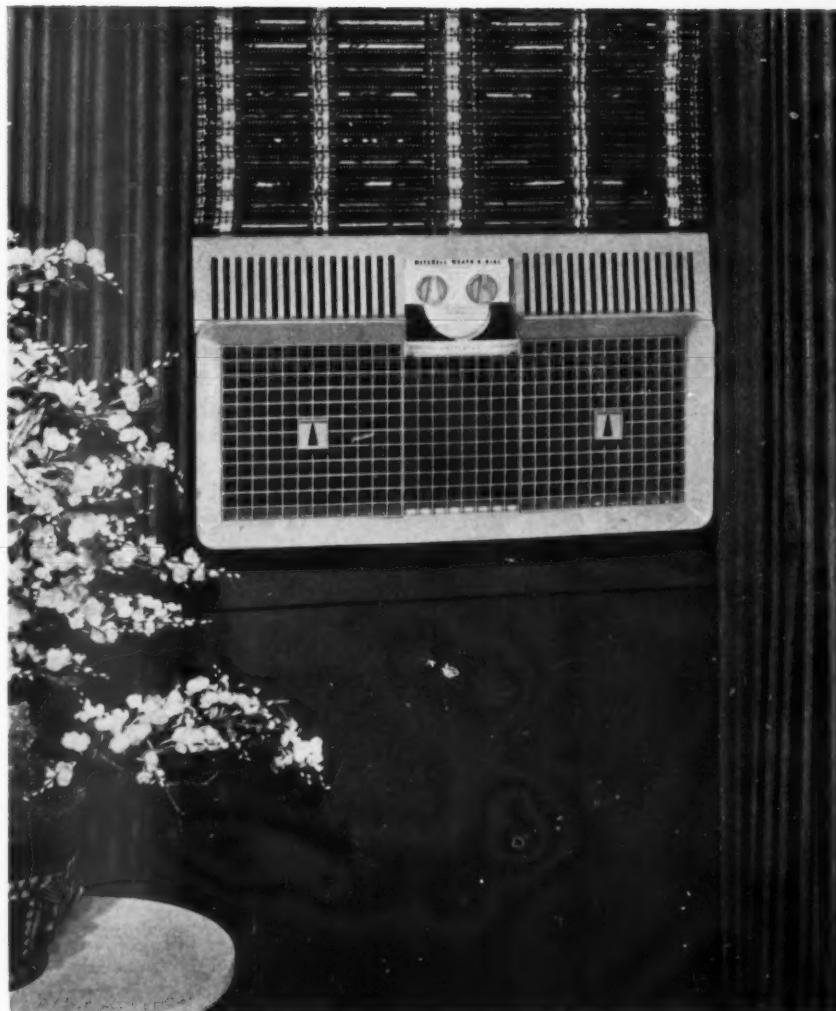
WAREHOUSES: NEW YORK CHICAGO LOS ANGELES DALLAS

Machine Screws • Wood Screws • Wood Drive Screws  
A & B Tapping Screws • Dowel Screws  
Roll Thread Carriage Bolts • Hanger Bolts  
Stove Bolts

For samples and stock list, write Box 1360-F2



THE *finish*  
*spotlight*



Compactness and power at low cost are featured in the 1956 Deluxe series of room air conditioners by The Mitchell Manufacturing Company, Chicago. Small enough to fit a window only 27 inches wide, the Deluxe models are regulated by simple twin controls. Units are available in  $\frac{1}{2}$  H.P., 1 H.P., and  $1\frac{1}{2}$  H.P.



## YEAR-END CONFERENCE

# Institute of Appliance Manufacturers

finishfotos

DECEMBER 5 and 6 were the dates and the Netherland Plaza, Cincinnati, Ohio, was the place for the Institute of Appliance Manufacturers Year-end Management Conference. It proved to be an interesting meeting for those attending.

On Monday morning the gas heating division heard two papers. D. E. Collins, sales engineering manager, Peoples Gas Light and Coke Company, spoke on "Utility cooperation in space heater marketing", and Howard L. Bourner, industrial designer, spoke on "Past and future trends in gas heater design."

At the general luncheon Monday the featured speaker was Fred A. Kaiser, vice president and sales manager, Michigan Consolidated Gas Company, whose sub-

ject was "From the outside looking in." Mr. Kaiser suggested that the appliance industry look to the automotive industry as an example of what could and should be done. He pointed out that the automotive industry has found, developed and used good professional management, good financing and good dealers. All of these tools could well be used to better advantage by the appliance industry. He went on to urge that appliance manufacturers build and advertise a quality product. He said that he is tired of having appliance salesmen offer him nothing but a product that is cheaper.

### Dawson predicts a good year in 1956

During the afternoon of the 5th

Richard Harkness, NBC, and James M. Dawson, vice president and economist, National City Bank of Cleveland, were the featured speakers. Mr. Dawson said that 1956 is going to be a good year but possibly not quite so good as '55 — subject to revision as the year's business develops. He also mentioned that the number of families of a \$5,000 or more income per year was probably 24,000,000 for '55 as compared to about 7,000,000 in '44.

On Tuesday morning W. Frank Fisher, vice president and general manager, John Wood Company, Bengal Range Division, and president of the Institute, presented his report, "An inventory of the Institute". He said, "In taking stock of the Institute, which is

Fisher



Kaiser



Stevens



Vignos





Ritzenthaler



Gray



Guthrie



Rymer

now in its 23rd year, it might be well to review the membership. It is interesting to note that the average term of membership of active members is slightly over 20 years. As to our associate-supplier memberships, the average term is ten years, and the doors were only opened to associate membership twelve years ago. This sort of record certainly seems to indicate that members are loyal and find the Institute of great service to them."

#### **Major appliances — a \$4,500,000,000 industry**

The second speaker Tuesday morning was Elisha Gray, II, president, Whirlpool-Seeger Corporation, whose subject was "Let's take stock of the appliance industry." Here are a few of Mr. Gray's comments. "The major appliance industry not including T.V. is today a 4½ billion dollar industry. In consumer durables it ranks second only to the automobile industry in economic importance.

"The population curve is rising — the number of families and family units is going up — not down. . . As the formation of new families continues to grow, the need for more goods and services and for additional housing and

its equipment must likewise expand. I do not think it is a "pipe dream" to anticipate that by 1965 consumers will be spending something in the neighborhood of ten billion dollars for major household appliances. Whether the figure which I have just cited is exactly correct or not is not important. What is important is that an enormous potential buying power will be available because of the steady upward shift in income distribution. . .

"It is worth pausing here to consider the figures on capital expansion", he added. "Business is planning to spend 13 per cent more for new plants and equipment in 1956 than it has spent in 1955. That's an extra four billion dollars." (The figure for 1955 was 29.4 billion dollars — the record to date.)

"The significance of this tremendous increase in capital expenditures for 1956 means, I believe, a continued rise in the level of business activity. For it must be remembered that capital spending is the great multiplier of the economy — it accelerates and swells business activity and purchasing power everywhere."

He went on to say, "I see nothing which suggests anything resembling a violent shake-out in the economy. . .

We now possess a number of built-in safety devices which automatically cushion the economy against any repetition of the depression of the Thirties."

Later Mr. Gray said, "Although we have the tools to extinguish the fire, there still remains with us — in our own business cellars, if you please — one of the underlying causes for spontaneous combustion. I refer to the chronic problem of production and unemployment fluctuations resulting from excessive inventory fluctuations — the kind of thing which produced the business decline of 1954 and the recession of 1949. . . Until we have mastered our operating policies so as to avoid these results, the economy will continue to be vulnerable."

In closing Mr. Gray stressed management's "responsibility to the men who work in our plants — to the men who constitute our management groups." He pointed out that the business management must recognize the individual and said, "If we businessmen change our concept of what constitutes a profit and score ourselves on a broader base — the human base if you please — I think we will command the respect and support of every sector of the American people."

*to Page 116 →*

*Elisha Gray, II, speaking before the general session. At the speakers table are, from left to right: Pauline Dunckel, executive vice president, IAM; F. H. Guthrie, president, Newark Stove Co., and executive vice president, IAM; W. Frank Fisher, vice president and general manager, John Wood Co., Bengal Range Div., and president, IAM; S. B. Rymer, Jr., president, Dixie Products, and secretary-treasurer, IAM; and Walter F. Rogers, president, Crown Stove, and vice president — membership of IAM.*



Market facts Bulletin  
NO. 1

FERRO CORPORATION • CLEVELAND 5, OHIO

Appliance dealers vote Porcelain enamel  
best exterior finish for CLOTHES DRYERS... by 8 to 5 margin!

Two independent surveys recently conducted among 6,000 representative appliance dealers show a strong preference for Porcelain enamel, as shown below:

**Question:** "Which of these types of finish do you consider best for the outside of Clothes Dryers?"

**Answers:** 56.7% voted for Porcelain enamel, 35.1% for the second most popular finish, with 4.1% expressing no opinion.

For the interior of clothes dryers, the vote for Porcelain enamel was even more overwhelming.

**Question:** "Which of these types of finish do you think best for the inside of Clothes Dryers?"

**Answers:** 60.3% voted for Porcelain enamel, 20.8% for the second-choice material, with 5.0% expressing no opinion.

HOW DEALERS VOTED ON PRINCIPAL ADVANTAGES OF MATERIALS AND FINISHES

	Material "A"	Material "B"	Finish "C"	Finish "D"	Porcelain Enamel
Total Respondents—1,663					
Appearance from Sales Viewpoint	83	348	130	436	1,096
Sanitation and Ease of Cleaning	81	487	101	241	1,295
Resistance to Wear	136	737	71	112	973
Resistance to Rust and Corrosion	384	763	79	108	972
Resistance to Soaps and Alkalies	77	549	60	83	1,182
Resistance to Heat	159	572	59	98	907
Permanence of Finish	151	800	62	141	1,091
Total Number of Mentions	1,071	4,156	562	1,219	7,516
Number of Respondents Responsible for Mentions	507	1,040	245	570	1,489



## from the Editor's Mail

### magazine of value to us

Gentlemen:

Your magazine *finish* was received with great interest. . . Naturally we were particularly interested in the material pertaining to the National Safe Transit Committee. This magazine will be of value to us. . .

We have been engaged in a research program dealing with the evaluation of transportation hazards. Our primary concern has been with damage due to shock and vibration. We have developed the statistical theory for predicting the probability of damage. In order to use this theory it is necessary to obtain actual data. At this point we encounter difficulties.

You can see that your magazine can be useful to us, and we thank you for your thoughtfulness in sending it.

**Bayard E. Quinn**  
Professor of Mechanical Engineering  
Purdue University  
Lafayette, Indiana

### best means of keeping in touch

Gentlemen:

Though not now directly connected, I am still very much interested in the enameling industry, new products, new processes and new developments, (it gets under one's skin after 42 years' exposure) and I find *finish* next to actual contact, the best means of keeping in touch with what is doing. . .

**Fred Sutphen**  
Middletown, Ohio

It's great to get a comment from one who spent many years with Armclo serving the Appliance and Enameling Industries, and your letter is sincerely appreciated. Eds.

### finish . . . informative and helpful

Gentlemen:

I have referred to your fine publication *finish* on numerous occasions and have found it to be extremely informative and helpful in my work.

I would appreciate very much being considered for a complimentary subscription.

**Rudy Koehle**  
Process & Planning Engineering  
A. O. Smith Corp.  
Permaglas Div.  
Kankakee, Ill.

### please send tear sheets

Gentlemen:

We would appreciate your sending us one set of tear sheets of the following: July 1953 issue of *finish*, pages 29 to 31 inclusive.

If tear sheets of the above listed pages are not available, please send us negative photostats of same. . .

**Frieda Eisenbaum**  
Loewy Construction Company  
Division of Hydropress, Inc.  
New York, New York

The order for tear sheets including "Industrial Application of Metal Spinning" and "Fabricating The Steel Television Tube" was filled promptly. Eds.

*to Page 18 →*

PATENT NOS. 2,440,741, 2,704,370

Made by specialists in the  
designing and manufacture  
of clamp-down frames

Vance has pioneered in the manufacture of stainless steel clamp-down frames and has already produced more than a million!

When you use VanSeal Frames on your built-in sinks and ranges, you can be sure of a frame that will fit perfectly! Installations can be made with confidence.

VanSeal Frames assure easy, sanitary, self-aligning installation and added beauty for your countertop and built-in range units. Benefit from Vance Industries' long experience in making frames for all types of built-in units.

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*Before They Start*  
with  
**MACCO No. 400-K**  
*Safety  
Cleaner*

*Eliminates Fire Hazards  
Reduces Insurance Costs...*

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*... NEW, SAFE AND MORE EFFECTIVE  
THAN INFLAMMABLE CLEANERS*

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KEROSENE  
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If you are using any of these hazardous materials for the cleaning of  
dies, machines, tools, floors, etc., you are in constant danger of flash  
fires that so often prove costly and tragic.

Using Macco 400-K in your plant is actually a better fire protection  
than your insurance policy. It stops fires BEFORE they start—saves  
the loss of many man hours of time—prevents damage to plant and  
equipment and even loss of life. Macco 400-K is truly indispensable  
in all progressive metal-working plants where safety, economy and  
efficiency are the watchwords.

Order your supply today. Prevent that dangerous flash fire that may  
occur tomorrow. Write or phone your Macco Sales Engineer for a  
Macco 400-K demonstration. No obligation.

Macco makes many  
other Metal-Work-  
ing specialties that  
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Makers of Better Metal-Working Compounds  
Since 1931

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**MACCO**  
PRODUCTS COMPANY

# THE finish LINE

**Polio isn't licked yet . . .** for there are tens of thousands of polio victims "born too soon" — before the arrival of polio vaccine. There are still many, many polio victims who need help, and there will be tens of thousands more stricken before the nation has complete vaccine protection. We are devoting a section of this editorial page to a reminder of the annual March of Dimes Fund, for we feel that the appeal transcends in importance any other editorial message that we might present in the space allotted. We are certain that a timely reminder is all that any *finish* reader will need to do his or her part for this worthy cause.

**W**E will take the remaining space for comment and to thank *finish* readers for their response during 1955 to the efforts of our editorial staff to keep them posted on business and plant information in the fast moving fabricated metal products field.

Home appliances and many other fabricated metal products have enjoyed their biggest year during 1955, and *finish* devoted a far greater number of editorial pages to the industry than during any preceding year.

"**From raw metal to finished product**" . . . has been a slogan here at *finish* for over seven years. Our editors have gone all out to give this slogan a literal meaning in relation to the monthly content of our publication, and response from readers indicates that we have been reasonably successful.

Continued strong reader response is both encouraging and helpful in connection with editorial planning for the coming months.

Readers have been very responsive to advertising, too, and this has unquestionably been an important factor in a report from the *finish* business department that the publication has just closed its biggest year in advertising dollars.

**Metal products sold "big" for '55** . . . Late reports on gas appliances show gas-fired warm air furnaces up 17.5% in October over the 1954 figure — gas ranges were up 4.6% in November over the previous year — gas water heaters were up 7.5% for November, totalling 192,500 units for the month.

The National Electrical Manufacturers Association has released the following estimates of total industry sales of major electric appliances for 1955: electric household refrigerators, 4,025,000 (units); electric ranges, (standard and built-in) 1,600,000; electric storage water heaters, 900,000; dishwashers, 295,000; food waste disposers, 520,000 and dehumidifiers, 92,000.

The Steel Kitchen Cabinet Manufacturers Association, Cleveland, announces that 1955 unit sales of steel kitchens are expected to reach a total of 4,046,000, an increase of 674,000 over the 1954 total, and dollar volume will reach \$35 million over the 1954 total.

Factory sales of standard-size household vacuum cleaners in October were 33.2% higher than the same month in 1954, and were greater than September, 1955, sales by 13.7%, according to the Vacuum Cleaner Manufacturers Association.

**A big year ahead . . .** is the general theme of forecasts coming to us from leading associations, raw materials producers and manufacturers of finished products.

You will see one of the early industry reports and forecasts features on page 28. This covers the story of the Home Laundry manufacturing industry. Next month you will see our annual features covering the Electrical Industry and Gas Industry forecasts, together with our own editorial report based on interviews with leaders in the *appliance and metal products manufacturing field*.

*Dana Chase*  
EDITOR AND PUBLISHER



# PERMA-VIEW SELLS more new ranges



46 leading stove  
manufacturers now  
use PERMA-VIEW

Home makers have come to expect "visible cooking" when they buy a new range. PERMA-VIEW, "the window you can see through always", is the logical answer to this demand.

Forty-six leading range manufacturers are incorporating the steel incased double pane PERMA-VIEW window in their deluxe and volume models as a feature with selling power to move new ranges.

You can take advantage of this sales acceptance, too, by calling on our Engineering Department to adapt its use to your range.

The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range. "Out of our carton into your door." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone us at MArket 4-2256 and we will give you complete details on the ease and economy of adding this sales feature to your new ranges.



## MEETINGS

### HEATING AND AIR-CONDITIONING MEETING

American Society of Heating and Air-Conditioning Engineers, Inc., annual meeting, Cincinnati, January 23-25.

### PLANT MAINTENANCE & ENGINEERING SHOW

Plant Maintenance & Engineering show, Convention Hall, Philadelphia, January 23-26.

### HOME FURNISHINGS MARKET

The International Home Furnishings Market, Merchandise Mart, Chicago, January 9-20.

### ENAMELERS CLUB MEETING

Central District Enameler's Club, Hotel Leland, Mansfield, Ohio, January 20.

### MATERIALS HANDLING CONFERENCE

Conference on Materials Handling, Purdue University's Department of Industrial Engineering and Indianapolis Chapter of American Materials Handling Society, Purdue Memorial Union Building, Lafayette, Indiana, February 16-17.

### NAT'L. ASSOCIATION OF METAL FINISHERS

Management Seminar, National Association of Metal Finishers, Conrad Hilton Hotel, Chicago, January 27-28.

### MIDWEST WELDING CONFERENCE

Annual Midwest Welding Conference, Armour Research Foundation, Illinois Institute of Technology, Chicago, February 1-2.

### CONFERENCE ON ARCHITECTURAL AND MAINTENANCE PAINTS

Conference on Architectural and Maintenance Paints, Case Institute of Technology, Tomlinson Hall, Cleveland, January 25-27.

finish JANUARY • 1956

# AUTOMATION the Nickeloid Way



Even before they arrive at your plant, Nickeloid PRE-Plated Metals are 60% through your production process. No cleaning, plating or polishing . . . that's been done for you—expertly, uniformly, accurately. You just fabricate; then assemble. By-pass 3 out of 5 basic production steps. Reduce costs up to 20%; save time and lower investment in inventory and equipment.

Specify Nickeloid PRE-Plated Metals, in durable uniform finishes of chrome, nickel, copper or brass on base metals of steel, zinc, copper, brass or aluminum.



SHEETS • COILS • STRIPS  
*A variety of finishes and patterns*

SEND FOR FREE SAMPLER-SELECTOR  
In handy slide-chart form, gives specifications, finishes and typical uses of Nickeloid Metals. 8 metal samples. Request yours on your company letterhead.

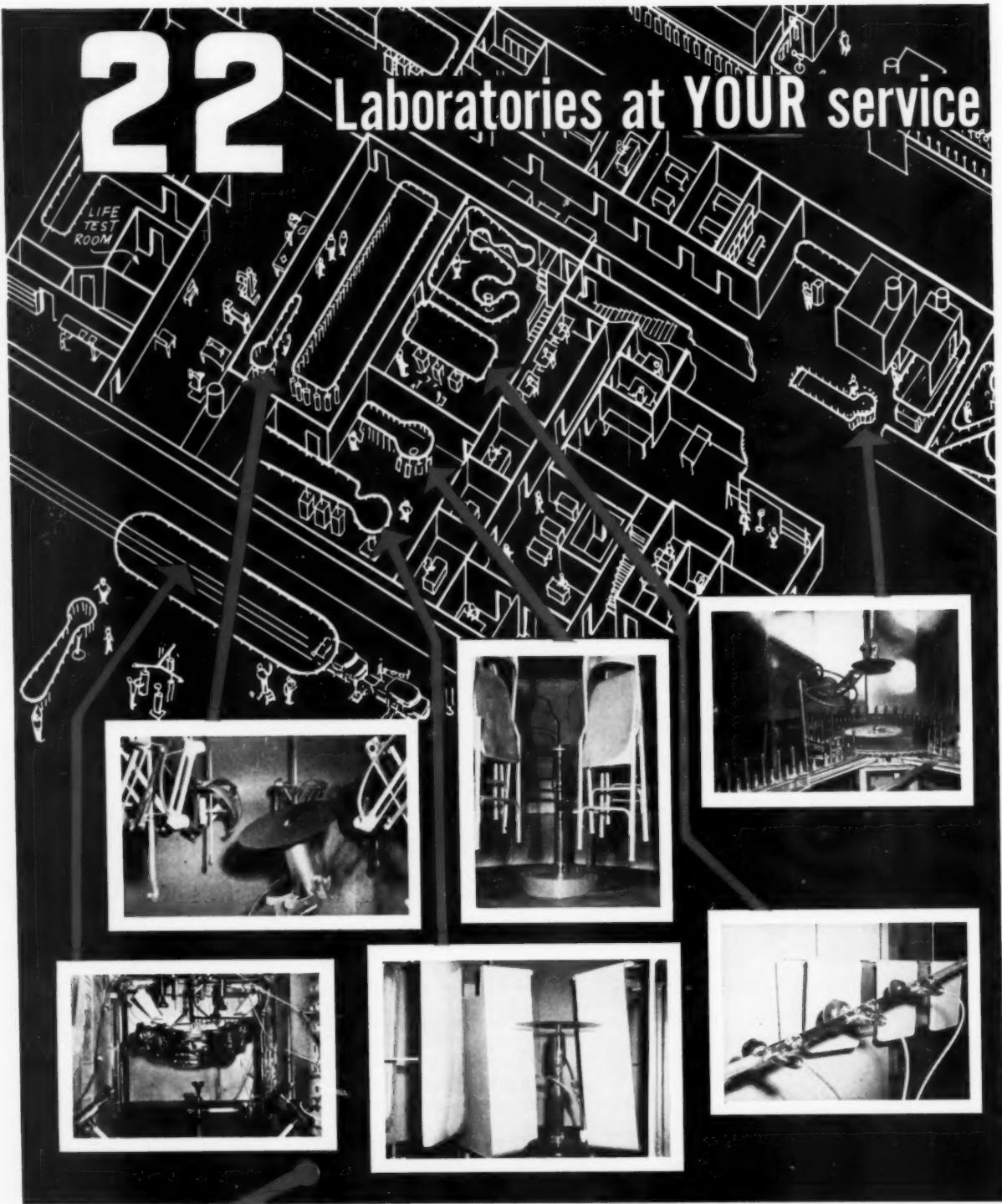
NICKELOID METALS  
SINCE 1898



Sales offices in most principal cities  
AMERICAN NICKELOID COMPANY  
Peru 11, Illinois Mills: Peru, Ill. — Walnutport, Pa.

# 22

## Laboratories at YOUR service



YOUR JOB, LIKE THESE SHOWN ABOVE, WILL BE TEST PROVEN

under simulated production conditions to determine cost-saving benefits and other advantages. Ransburg also maintains other test facilities in Los Angeles, London, England; Bad Hersfeld, Germany; Paris, France and Sydney, Australia.

to prove the painting of YOUR products with



# Electrostatic Painting Processes

Let us make laboratory tests and prove the advantages and cost-saving benefits of painting YOUR products AUTOMATICALLY with one of the Ransburg Electro-Spray Processes.

**GET THE FACTS . . . IT COSTS YOU NOTHING!**

#### **STEP BY STEP—HERE'S WHAT YOU GET...**

- Survey of your plant by Ransburg's experienced field engineers, including savings estimate.
- Lab painting demonstration of your products, using equipment closely simulating your own production conditions.
- Accurate measurements of paint film thickness.
- Engineering report of detailed tests to determine paint and labor savings.
- Coated samples of your job, lab production photos, and even movies if desired.
- Detailed drawings of equipment and workholder.

All of the above without obligation to you. And, before equipment is installed you receive detailed, pre-installation instructions. Too, a well-qualified, experienced engineer supervises installation and trains your operator on the job. Ransburg offers continuing laboratory and field service to help you with any of your finishing operations.

● First, Ransburg sales engineers will make a survey in your plant to check the possibilities of using Electrostatic Spray Painting on your products. Next, you will send samples of your unpainted products—with paint—to the Ransburg laboratories in Indianapolis.

Here, the technical staff takes over. The Ransburg Engineering staff—which includes PH.D.'s and Masters in Physics, Science, Electrical, Mechanical and Chemical Engineering—makes a complete study of your job. Not only do they have the necessary academic training, but they have the "know how" gained from years of actual experience in the field. Ransburg, you know, was the pioneer in Electrostatic Spray Painting 15 years ago. Engineers and well-qualified technicians have at their disposal every facility for conducting complete tests, simulating your own production conditions. They'll decide which type conveyor is best suited for your job. (There's a conveyorized lab set-up—22 in all—to handle products ranging in size from automobile bodies and chassis to small components, such as window hardware.) They'll design workholders, if necessary, and determine exactly how your job can be run to your best advantage. Details, such as fixture spacing, will be worked out too.

After preliminary studies and tests, you are invited to Indianapolis to see your job run in the lab. If you wish, photos and even movies of your test run can be made and furnished for your own production people to study. You see first-hand what Ransburg Electrostatic Spray Painting can do for you in your own plant.

#### **YOU GET PAINT AND LABOR SAVINGS**

Paint usage is accurately measured during the demonstration. The Ransburg No. 2 Process will provide savings up to five times the paint mileage of hand spray. And, one unit can do the work of many hand sprayers. You will see the improved, uniform quality of the work . . . you'll know what kind of increased production to expect, and you can recognize labor savings. ALL OF THIS WITHOUT OBLIGATION.

Ransburg service doesn't end there. After the equipment is installed in your plant—with our supervisory help—we will train your operator and continue to work with your finishing department. Our technically-trained field service engineers are always available to assist with any of your finishing problems.

Briefly, that's our story. Now it's your move. Call or write. Dept. F.





# NATIONAL LOCK

makes a lot of them . . .

and a lot of companies count on  
getting them regularly from  
THIS DEPENDABLE SOURCE

Here are just a few of approximately 30,000 items made by NATIONAL LOCK and used by American industry in the manufacture of virtually every type of product. Let us show you how the extensive facilities and large employee organization of NATIONAL LOCK can benefit *your* company.



### What NATIONAL LOCK Products can be of service to You?

- Screws and Bolts for Wood and Metal Applications
- Stampings... Pressure Zinc Die Castings
- Chest Locks... Cabinet Locks... Friction Catches... Casters
- Plastics, Thermoplastic and ThermoSetting
- Handles... Pulls
- Butts and Hinges
- Combination Shackle Locks and Built-In Locks
- Refrigerator and Stove Hardware ... Both Standard and Custom
- Extensive Line of Kitchen Cabinet Hardware

NATIONAL TUTCH LATCH...  
Opens Cabinet Doors Automatically

write for complete  
information and estimates  
quality hardware...all from 1 source



**NATIONAL LOCK COMPANY**  
Rockford, Illinois

### Editor's mail → from Page 11

#### would like to receive finish

Gentlemen:

Please add my name to your circulation list. You have a worthwhile magazine and it will be read with interest by our engineers and chemists in the Manufacturing Technical Service department.

M. T. Angelo  
Department Manager  
Mfg. Technical Service Dept.  
Lockheed Aircraft Corp.  
Burbank, California

#### NEMA article . . . excellent

Gentlemen:

This is to acknowledge and thank you for the copy of the November issue of *finish*. I have read the article on NEMA and think it is excellent . . .

A. H. Manwaring  
Vice President  
Phila. Electrical & Mfg. Co.  
Philadelphia, Pennsylvania

#### eyelet coating equipment

Gentlemen:

We are in receipt of five copies of letters you have written on our behalf in an effort to locate a supplier for eyelet coating equipment, and take this opportunity to thank you for your kindness.

B. C. Lamb  
British Canadian Enterprises  
Winnipeg, Canada

#### standard screw gauge

Gentlemen:

The L-10 standard screw gauge illustrated on page 81 of a recent issue of *finish* appeals to us and if possible we would like to have six of these gauges for use by our production foremen.

G. R. Wineholt  
Buyer  
La Porte Division  
The Coleman Company, Inc.  
La Porte, Indiana

Gentlemen:

Please send us one of the new combination standard screw gauges illustrated in your December 1955 magazine. If possible, we would appreciate an extra one for our Engineering Department.

Ray Bryk  
Purchasing Agent  
Royal Appliance Mfg. Company  
Cleveland, Ohio

Gentlemen:

We are interested in the standard screw gauge as written up and illustrated in your excellent magazine *finish* . . .

Walter Cham  
Sr. Factory Engineer  
Room Air Conditioners  
Carrier Corporation  
Syracuse, New York

These are representative of dozens of letters requesting a gauge offered in the December issue of *finish*.

**It takes both to ring the bell.**

QUALITY

ECONOMY



**KETONE LACQUER SOLVENTS**  
**give better flow, blush-resistance,**  
**gloss—and a price advantage, too!**

In either nitrocellulose or vinyl lacquers, ketones yield solutions of high solids content, or permit greater diluent content—with either aromatic or aliphatic diluents. In any formulation, ketones produce lacquers with superior characteristics at no increase in cost.

Ketone-based solvent systems assure complete flexibility in formulating. You add the latent solvents you prefer. In addition, they give you a price advantage. When you buy by the pound, and sell

by the gallon—the lower specific gravity of ketones favors you. Important, too—ketones are high-purity solvents at no extra cost. You get all active solvent.

The Shell Chemical "quality group" of active solvents includes MEK, MIBK, and EAK, as well as latent solvents MIBC, IPA and Ethyl Alcohol.

Ask your Shell Chemical representative to help you evaluate ketones in your own formulations.

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**for refrigerators  
with sales appeal\***

## **Guardsman®**

### **CHEMGARD PRIMER**

A highly moisture resistant primer for application by spray. Formulated for exceptional toughness and adhesion. Good enamel hold out develops the full potential of the enamel coat and provides a perfect base for the sort of high gloss finish demanded in the refrigerator industry.

### **PERMAGLO ENAMEL**

A high gloss enamel with excellent hiding and resistance to moisture and food stains. Available in white and colors, and offering outstanding color retention. Bakes to a hard, porcelain-like finish.

*An ideal combination of resistance, color retention  
and beauty for refrigerators and other applications  
where finest quality enhances sales appeal.*

**GRAND RAPIDS VARNISH CORPORATION**

**GRAND RAPIDS, MICHIGAN**

*Makers of the Famous Guardsman Finish and Guardsman Cleaning Polish*

**\*THE BETTER THE FINISH, THE BETTER THE BUY**



**"Know how", not brawn, gives you quality  
in Youngstown sheets and strip**

As you walk through the new cold mill at our Indiana Harbor Works, you are impressed with the smoothness of its operation—in an atmosphere of efficiency, quiet and cleanliness. Everywhere you see men at electronic controls of great machines—mills, furnaces, levellers, shears, cranes, conveyors. The old-time practices of doing things by main strength and

opinion have been replaced by "know how" and scientific control. The result is the improved product you now receive—with qualities built into it to make it meet exactly the requirements of your forming and fabricating presses. And there's a uniformity of perfection undreamed of in the good old days—every square foot just like the next.

# Youngstown

COLD ROLLED  
SHEETS  
AND STRIP

**THE YOUNGSTOWN SHEET AND TUBE COMPANY**

General Offices Youngstown, Ohio      District Sales Offices in Principal Cities.

*Manufacturers of*  
Carbon, Alloy and Moly Steel

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT -  
MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE  
TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

# COLOR . . . the vital impact

by Howard Ketcham



it is not profitable to sell Anna Held colors  
in the Marilyn Monroe era

HERE is an idea of how important color is today in influencing reactions and decisions.

The eye *cannot* see form or design without the contrast color affords. Perhaps that's why 87% of all retail buying decisions in stores are made for or against merchandise because of color! And 70% of all purchases made in today's food stores are based on impulse — in which color plays the strongest role.

This all is due in part to the fact that the eye is 400 times quicker than the ear — and because people are influenced 90% by the emotional appeal color contributes and only 10% by reason. Yes, the sale of men's shirts climbed 852% in tested areas when shirts were offered in related colors.

By the very nature of things, color enters most prominently into the art of living. It registers on the most dominant sense in all normal people — the sense of sight. . .

#### Color, more color, extra color — you see it everywhere

Many well established traditions are succumbing to change. The black telephone is rapidly being supplanted by handsets made in as many as eight varied hues. We created these new telephone colors, and the sales figures we're getting are astounding. Ivory, green and beige are among the top favorites.

Kitchen and bathroom fixtures are now established in rainbow hues in response to consumer insistence. Prior to World War II, 80% of all houses with paintable surfaces were white. . .

Ships of the fleet, in response to the Navy's latest directive, have

abandoned depressing grey interiors and have given wide latitude in color choice to ship captains — all to provide better morale and improved habitability.

Color has been introduced in factories throughout the world to save workmen from danger hazards and to make factories pleasanter and more efficient places in which to work.

Office equipment from staplers to typewriters are now resplendent in color. And the third largest government building, the new National Security Administration structure, now nearing completion at Fort Meade, Maryland, is resplendent in a functional color decor. Automobile manufacturers find color a far less costly and *far more appealing* obsolescence tool than radical design change innovations.

#### Color plans for supermarkets

Supermarkets once were innocuous looking in sanitary white. These white interiors were cheerless and created excessive eye-tiring glare. If a shopper were blindfolded and led into a representative store of any of these chains, it would be quite impossible, after the blindfold was removed, for him to identify the chain to which this store belonged because of the total lack of *any* distinguishing color characteristics on the interior. The trend today is for leading supermarket chains to adopt their own individual color plan identification. This insures better-looking, more appealing stores provides a shopping atmosphere favorable to the women shoppers, and provides a positive appearance of unity without too much undesirable uniformity throughout each store in the system. In this

connection colored porcelain enamel has been of invaluable use on counter facing, shelving, wall tile, refrigeration, display cases, lighting fixtures, store fronts and signs.

Housing, the nation's number one industry, and one that continues to grow at a faster pace than the economy of the country, is undergoing a radical evolution from custom built to prefabricated techniques. By 1960 it appears likely that every house built in this country at a cost of less than \$15,000 will be built of prefabricated parts.

#### Focus on color trends

What I want to get across is that the colors chosen for your products *must keep pace* with this changing world of ours.

We live in a changing world — and yesterday's colors may not be the answer to today's needs. Every single day you're selling to various people who live vastly different lives — to *younger* people (three out of five of today's 16 to 19-year-olds are married), to *bigger* families, to people who *don't stay put* (there have been five moves to a family in the last ten years — one in three families in America changed homes last year). You are selling to people with more education, for it is a well established fact that our children are staying in school longer. You are selling to people who have traveled more, heard more music, read more books and magazines, seen more TV. Yes, you are selling to a changing world, but if you are selling with yesterday's colors, *now is the time to look for new ones and new color merchandising techniques*. I like to remember the advice that Alexander Graham

# in today's sales

HOWARD KETCHAM, INC., COLOR STYLISTS,  
NEW YORK CITY

Bell gave to his children: "Don't keep forever in the public road", he said, "going only where others have gone. Leave the beaten track occasionally and drive into the woods. You will be certain to find something you have never seen before!"

And are you ready for the boom in taste? It could throw you a bad curve. For the better educated our people are, the broader the lives they lead, the more their tastes grow and change, and the more readily they accent the new and discard the old. Andrew Heiskell, publisher of *Life*, has this to say: "To the average person each new interest makes him that much more receptive to further change. As each American — thanks to education — climbs the cultural ladder, he becomes a better customer." And he might very well have added, a better customer for color. A lot of businesses are going to be caught at the starting post because they aren't predicting accurately what the rising curve of education will do to mass taste. The signs are here right now. Are you reading them? And how about this change?

## It's a spending life

The 20th Century Fund says rather grandly that today's customer has "a propensity to spend". Men used to call it money burning holes in their pockets. Your customer is ready to pay for the good life, as she sees it. She's been buying more durables — things that last, like houses, refrigerators, new stoves, new cars. She's been spending less for movies, more for television. But much more significantly than any of these, she's been buying fewer clothes. Clothes don't seem to be the symbol of the good life that they used to be. . . She's buying *your goods* — if they appeal to her! If they keep up with her.

## Now — how you can keep up with all these changes

Actually your problem of keeping pace with color is easier than you think. It's simply a matter of getting the facts on color — and using them intelligently.

More mistakes in color planning (and they are costly!) come from a lack of facts than from faulty taste or bad judgment. I can't preach this one gospel too strongly. "First, get the facts — find out what your customers want *before* you start producing profitless and needless colors."

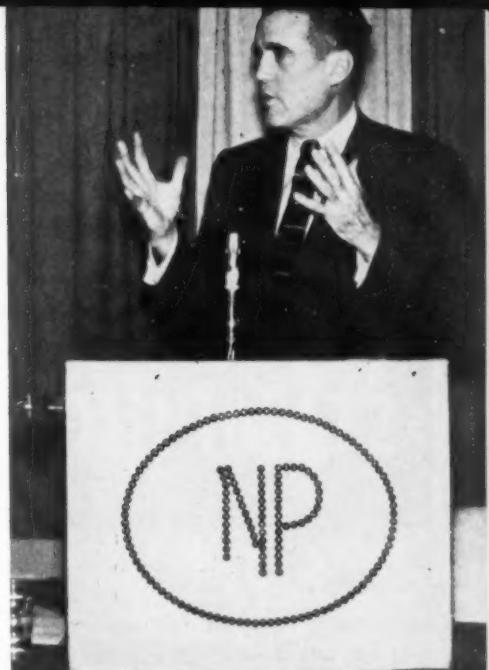
We think we understand our customers. But do we? What have you individually done in the last six months to make you know your customer better. Have you personally read your customer mail, really read it, really cared? Have you rung a doorbell or visited a panel or made some personal effort to see your customer, to understand her problems? Have you personally found out where, when and how she is using your products in her busy world today? Have you found out what she likes, what she dislikes? Remember, when you are talking to women prospects, color is not just an extra feature. It is the first and most important thing that interests them. Color sells women, and women have been known to sell their husbands.

*Time* magazine stated that the best thing about Lustron houses were the colors. A recent survey conducted among owners of Lustron houses who had lived in their homes for six consecutive years brought out the fact that 94% of these people do not want to change any one of the exterior or interior colors on their houses.

Early in 1953 our firm was retained by Mr. William C. Newberg, president of the Dodge Division of Chrysler Corporation, to determine why the Dodge car was not selling.

After we had accumulated the needed facts I prepared a candid and objective report, complete with recommendations. No punches were pulled. But the Dodge management did not take any of the steps proposed as a result of our market analysis.

In 1954 Dodge sales dropped 50%. That did it. The 1955 Dodge was a



Howard Ketcham

finisphoto

representation of many of the customer wants determined by our studies plus a number of additional styling and engineering improvements put forward by the manufacturer's able staff.

Dodge sales have since increased more than 300%.

Without proper research, manufacturers can only guess at color preference and acceptance by the public. Manufacturers can only guess at the saturation point of public interest — at the proper time to stop producing certain colors and develop new ones. In most lines there are definite seasons for certain colors, and when fatigue and boredom set in, it's time for impartial, scientific color surveys, capably conducted at regular intervals.

## Fact-finding plans

Selected investigators are trained for this highly specialized work and then given extensive field assignments. In small towns and big, on farm and in metropolitan areas people are interviewed. Often different industrial groups are seen. That part is purely mechanical.

Now it is easy to get the facts, but interpretation is the most important factor, since it is through proper analysis that correct forecasts may be arrived at.

This much may be said on survey results. With market research repre-

to Page 120 →

*Complete*

## STAMPING FACILITIES

Danielson is equipped for complete service to the Appliance and Metal Products Manufacturer — from precision tooling to the finished stampings. We specialize in deep draw parts . . . in BRASS—STEEL—ALUMINUM and STAINLESS STEEL.

Our complete facilities include: Tool and Die Department — Press Department — Shearing — Circle Shear — Spot Welding — Arc Welding — Silver Soldering — Hydrogen Brazing — Polishing — Degreasing — Painting — Assembling.

No job is too small, too big or too difficult—send us your prints, we will be happy to quote prices.

Besides our Giant Deep Draw Presses, the 150 ton High Production Hydraulic Draw Press, as shown at right, handles up to 600 pieces per hour . . . Better — faster — more dependable service from Danielson.



99% pure aluminum part 23" dia. — 13" deep, shown above, was drawn on our 300 ton Hydraulic Press. Illustrated at the left is Steel Tank made in two draws. 12" scale shows comparative size.

Write — 'phone or wire us today!



**V. W. DANIELSON**  
MANUFACTURING COMPANY

3360 W. HOPKINS ST. • MILWAUKEE 16, WISCONSIN • Phone CUSTER 3-3800

# Six ideas for improving your new home laundries

ONE OF THE most important trends in modern home laundries is the increasing use of aluminum—to improve product quality and to provide extra sales appeal.

For example, aluminum is the *logical* material for the six washer and dryer parts shown below.

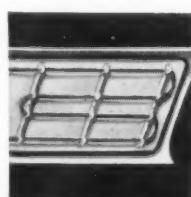
By specifying these parts in aluminum, manufacturers get a competitive edge that no other material can provide—plus major production advantages. Aluminum is extremely workable, economical to fabricate, and is easily treated for decorative or protective purposes.



**Lids and top covers** made of Kaiser Aluminum are tough and durable—take the roughest handling without chipping, scarring or warping! No danger of rust or corrosion to stain clothes. Aluminum's natural beauty is an effective eye-catcher on the sales floor. Or aluminum may be finished with porcelain enamel or anodized in color if preferred.



**Controls** made of Kaiser Aluminum are unaffected by moisture, heat-resistant, wear-resistant—retain their "new" look after years of constant service. Some can be anodized in a variety of colors for unusual designs that attract customers.



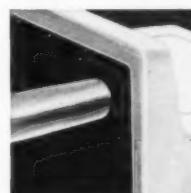
**Heat reflectors** made of Kaiser Aluminum greatly increase the efficiency of dryers. Heat reflectivity of aluminum is far superior to steel or other materials, and is retained indefinitely.



**Revolving drums** made of lightweight Kaiser Aluminum reduce motor load and permit improved designs. Aluminum's heat conductivity and reflectivity contribute to more efficient operation and customer satisfaction. No rust or corrosion problems in the presence of moisture vapor.



**Tubs and agitators** made of Kaiser Aluminum require no porcelain enameling for moisture protection. However, cast aluminum agitators are now successfully enameled with a porcelain that gives a far smoother and shinier surface than enameled steel. This finish is color fast, resists fading and discoloration from detergents, salt water, alkalies and acids. Aluminum is extremely easy to clean. Light weight reduces load on motor, provides smoother, quieter action.



**Exhaust stacks** made of Kaiser Aluminum won't rust and won't corrode. These stacks will give years of trouble-free service.

INVESTIGATE these six ideas for your new home laundry equipment without delay. Benefit from aluminum's unique combination of advantages, including: light weight with strength, thermal conductivity, electrical conductivity, heat and light reflectivity, corrosion resistance, handsome appearance, non-toxicity, ease of fabrication, economy.

An experienced Kaiser Aluminum engineer will be glad to work with you immediately at your request. Contact any Kaiser Aluminum sales office listed in your phone directory. *Kaiser Aluminum & Chemical Sales, Inc. General Sales Office, Palmolive Bldg., Chicago 11, Illinois; Executive Office, Kaiser Bldg., Oakland 12, California.*

## Kaiser Aluminum

setting the pace—in growth, quality and service

# In water for 12,000 hours!

**Severe Immersion Tests Prove  
Exceptional Resistance to Corrosion and Moisture of  
Pittsburgh's Special Finishes Used on**



Attractive appearance of Yorkaire Conditioners, such as this Model 552B, is improved with Pittsburgh's Tan Wrinkle Finish. Interiors are finished with Tan Baking Enamel. Both finishes are sprayed on and baked for 30 minutes at 325° F.



**AIR CONDITIONERS**



The exceptional performance of Pittsburgh's special finishes for residential and commercial cooling equipment is the result of long and close cooperation with such leaders in this industry as the York Corporation, makers of Yorkaire Conditioners.

Unusual resistance to moisture and humidity is the chief requirement of these coatings. To assure their ability to withstand rust and corrosion, these finishes are subjected to severe immersion and humidity tests. Finishes used on framework, pan sections and operating parts are tested for as long as 12,000 hours. Decorative enamels for exteriors are tested similarly for 6,000 hours,

besides being given prolonged exposures to blistering Florida sun to confirm their excellent weathering qualities.

By working with designers, engineers and production executives in the air conditioning field, Pittsburgh has developed finishing materials which contribute to attractive appearance and give added years of satisfactory service.

Call on us for suggestions or advice on your finishing problems. We may be able to save you time and money. Write, wire or phone Pittsburgh Plate Glass Company, Industrial Paint Division, 1 Gateway Center, Pittsburgh, Pa.



## PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



When you've got your eye on the one who will buy,  
you use **Bonderite under the paint**



BUY-SIGN for people  
looking for lasting finish...

Bonderite seals, furnished free  
to Bonderite users, promise  
"This product will look better  
longer." Six million will be  
used this year. Write for infor-  
mation on Bonderite seals for  
your product.

● There are lots of reasons for preferring Parker's corrosion  
resistant paint base, Bonderite: dependability, over-all economy,  
quality of product, results and service.

There's another advantage that's *exclusively* Bonderite's: Only  
Bonderite is known to *your* customer, the ultimate consumer. A  
quarter of a century of national advertising has established a cause-  
and-effect relationship between Bonderite-protection and a product  
that looks better longer.

Yes, when you've got your eye on the one who will buy, you use  
Bonderite under the paint—and use it to help you make sales.

\*Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U. S. Pat. Off.

**PARKER RUST PROOF COMPANY**  
2157 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE  
corrosion resistant  
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BONDERITE and BONDERLUBE  
aids in cold forming  
of metals

PARCO COMPOUND  
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heavy duty maintenance  
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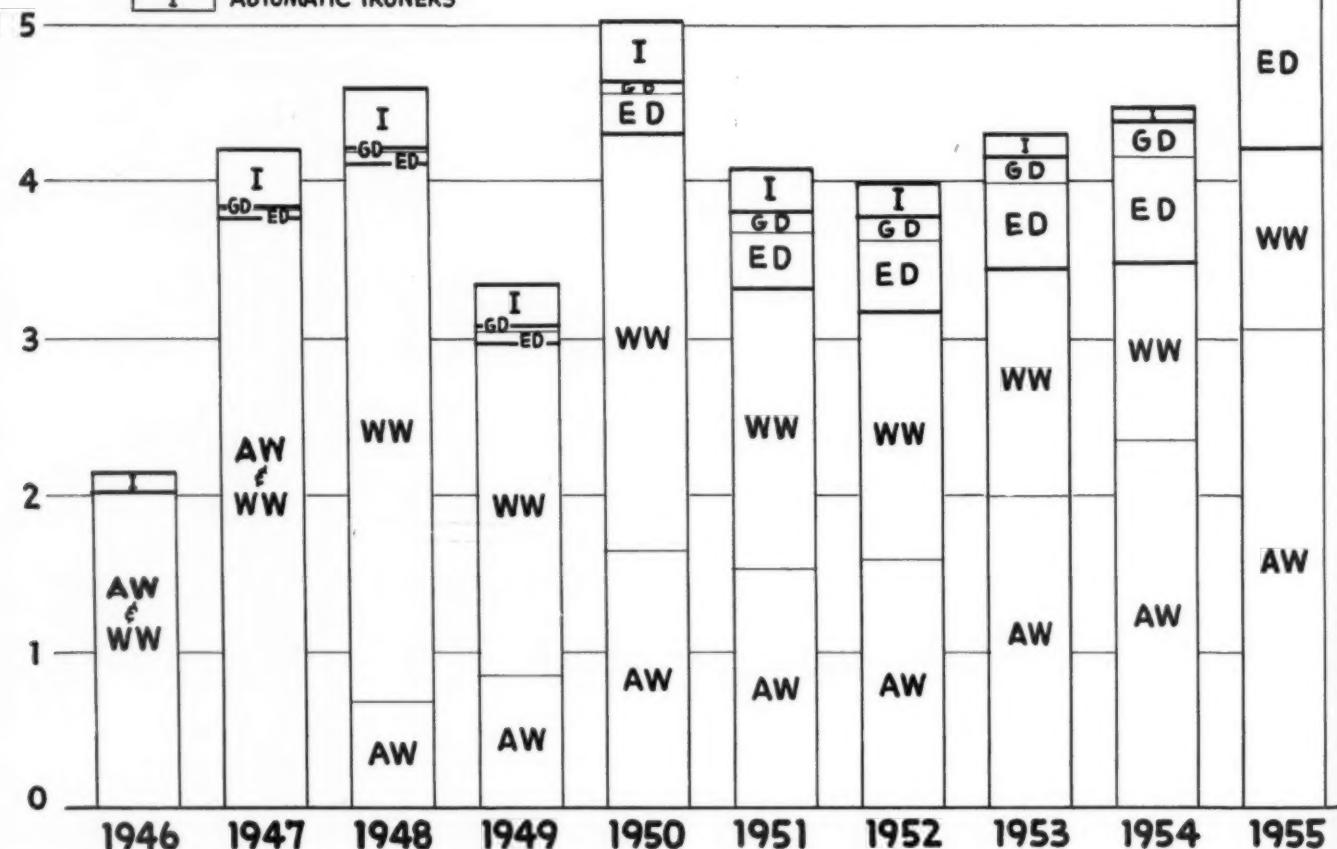
Since  
1915—  
leader in  
the field

# Factory Sales - Home Laundry Appliances 1946-1955

MILLION  
UNITS

6-

- AW** AUTOMATIC & SEMI-AUTOMATIC WASHERS
- WW** WRINGER & SPINNER WASHERS
- ED** ELECTRIC DRYERS
- GD** GAS DRYERS
- I** AUTOMATIC IRONERS



## The fabulous future for home laundry appliances

by Guenther Baumgart •

EXECUTIVE DIRECTOR,  
AMERICAN HOME LAUNDRY MANUFACTURERS' ASSOCIATION

THE home laundry appliance industry has just completed the most dramatic production year in its history. Nearly 5,700,000 washers, dryers and ironers were sold by manufacturers during 1955. Sales were nearly one-third

greater than in 1954 and 14 per cent above the previous peak year of 1950!

Furthermore, future sales are expected to continue to set new records each year through 1960. This prediction is based on the results of a recent industry-wide

forecast survey made by AHLMA members. At the time of the survey total factory sales for 1955 were expected to reach 5,300,000 units. Based on the level for 1955, the industry's expectations for the next five years are:

For	Median Forecast	Per Cent of Forecast For 1955
1955	5,300,000	100%
1956	5,450,000	102%
1957	5,560,000	105%
1958	5,903,000	112%
1959	6,170,000	116%
1960	6,473,000	122%

Certain members of the industry looked for peaks even higher than these. The most optimistic foresaw 6,335,000 units in 1956, increasing to over 8,000,000 washers, dryers and ironers by 1960.

#### Favorable factors

Fifteen factors which members of the industry feel account for the good year in 1955 include:

1. The widespread acceptance by consumers of the advantages of labor saving home laundry appliances.
2. The rapid trend toward automaticity throughout the nation — in the home as well as in factories.
3. The vigorous and highly competitive promotional efforts of the members of the industry, coupled with
4. The active campaigning being done by utilities, steel companies and soap and detergent manufacturers with other suppliers to promote the automatic home laundry.
5. The rapid spread of residential use of gas and electricity.
6. Widespread employment, coupled with
7. Continued increases in earnings, and
8. A relatively stable cost of living.

*to Page 114 →*



finish JANUARY • 1956

#### Washer sales for a 10 year period

Median Forecast For	Total Washers	Automatic and Semi-automatic	Wringer and Spinner
1955	4,200,000	3,060,000	1,140,000
1954	3,490,000	2,353,000	1,137,000
1953	3,460,000	1,999,000	1,461,000
1952	3,175,000	1,584,000	1,591,000
1951	3,327,000	1,532,000	1,795,000
1950	4,311,000	1,645,000	2,666,000
1949	2,978,000	860,000	2,119,000
1948	4,120,000	699,000	3,421,000
1947	3,788,000	(Data not Available)	(Data not Available)
1946	2,024,000	(Data not Available)	(Data not Available)

#### The median washer forecasts for the future

Median Forecast For:	Total Washers	Automatic and Semi-automatic	Wringer and Spinner
1955	3,935,000 100%	2,900,000 100%	1,100,000 100%
1956	4,030,000 103%	3,000,000 103%	1,015,000 92%
1957	4,041,000 103%	3,163,000 104%	908,000 82%
1958	4,122,000 104%	3,400,000 117%	820,000 74%
1959	4,250,000 108%	3,600,000 124%	801,000 73%
1960	4,450,000 114%	3,800,000 130%	725,000 66%

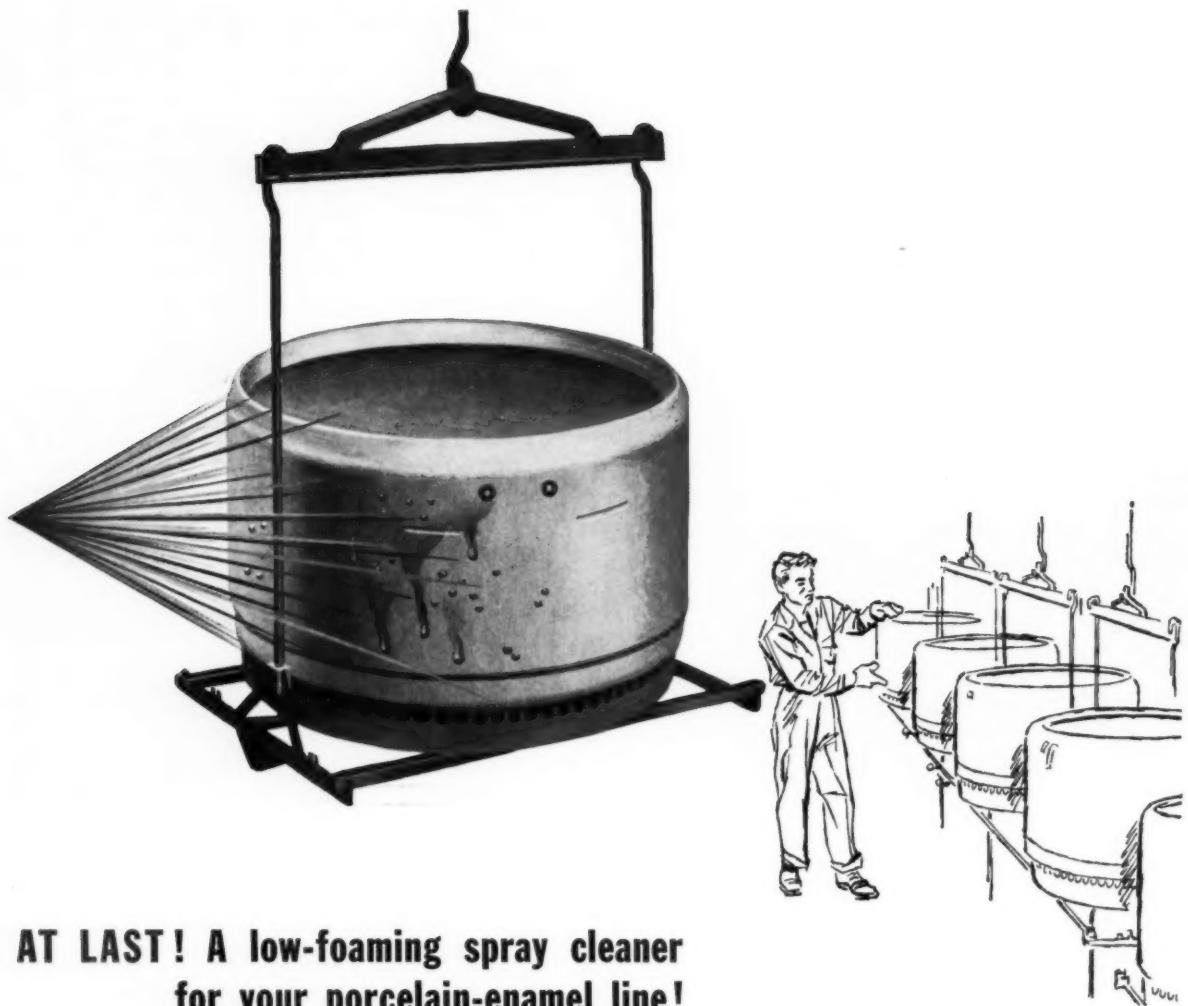
Note: Median forecasts did not necessarily add to the total forecasts because medians frequently differ from different individuals.

#### The shift toward automatic and semi-automatic washers

	Total Washers	% Automatic and Semi-automatic	% Wringer and Spinner
1948	100%	17%	83%
1949	100%	29%	71%
1950	100%	38%	62%
1951	100%	46%	54%
1952	100%	50%	50%
1953	100%	57%	43%
1954	100%	68%	32%
1955	100%	73%	27%
1956*	100%	75%	25%
1957*	100%	78%	22%
1958*	100%	82%	18%
1959*	100%	85%	15%
1960*	100%	87%	13%
Forecast*			

#### Dryer sales for a ten year period

	Total Dryers	Electric Dryers	Gas Dryers
1955	1,404,000	1,040,000	364,000
1954	898,000	662,000	236,000
1953	696,000	538,000	158,000
1952	615,000	454,000	161,000
1951	487,000	349,000	138,000
1950	318,000	251,000	67,000
1949	106,000	81,000	25,000
1948	88,000	73,000	15,000
1947	58,000	38,000	20,000
1946	4,000	2,000	2,000



## AT LAST! A low-foaming spray cleaner for your porcelain-enamel line!

### PENNSALT CLEANER 38 eliminates emulsion-cleaner combinations

Here's a brand-new low-foaming spray detergent that *works!* With new Pennsalt Cleaner 38 you can get the benefit of today's wetting agents in your spray-cycle equipment on the porcelain-enamel line; yet you do away with foam problems and with costly emulsion-cleaner combinations.

PENNSALT CLEANER 38 is completely *different* from other compounds. Without the foaming characteristic of other spray cleaners, 38 removes drawing lubricants and shop grimes never before thought movable. A delicate balance of wetting agents and high-alkali detergents in Cleaner 38 allows the use of this *one* low-cost spray cleaner . . . improves the quality of your work . . .

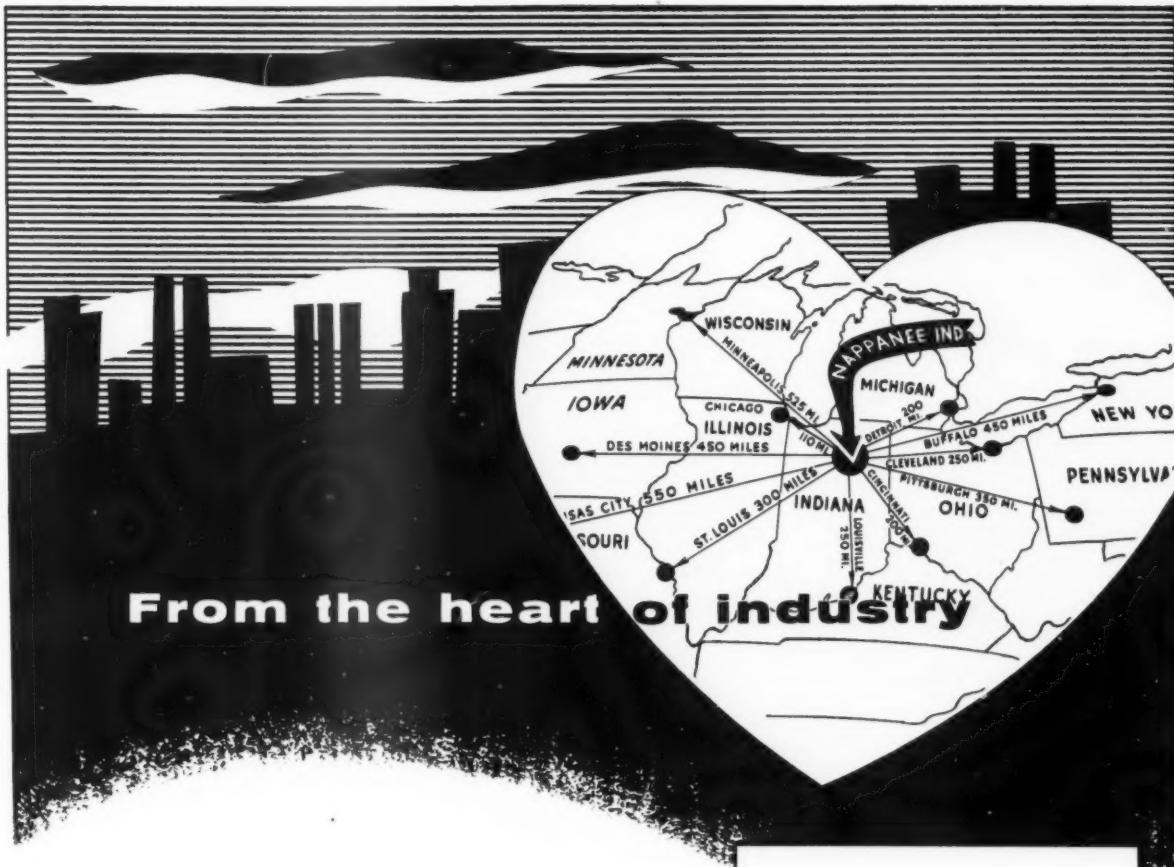
actually cuts your costs lower than you may have hoped for.

**WATCH 38 WORK** in *your* porcelain-enameling line! Call your Pennsalt man to arrange a demonstration, or write Metal Processing Dept. 247, Pennsylvania Salt Manufacturing Company, East: Three Penn Center Plaza, Philadelphia 2, Pa.; West: Woolsey Bldg., 2168 Shattuck Ave., Berkeley 4, Calif. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.



Metal Cleaners • Phosphate Coatings • Cold-Working Lubricants

A BETTER START FOR YOUR FINISH



## From the heart of industry

The Vitreous Steel Products Co. plant at Nappanee, Indiana, is in the HEART of America's economic and industrial center. Our fast transport trailer trucks allow prompt and economical deliveries to all our customers in plants from the west to the east coast. These trucks are able to bring back to our plant black iron parts to be enameled — usually with no extra charge. Spur tracks from the main line of the B & O to our loading platforms also make rail shipment a thrifty operation.

The highest skilled labor available in America is at work in our Indiana plant, assuring you of quality porcelain enameling work at a practical location.

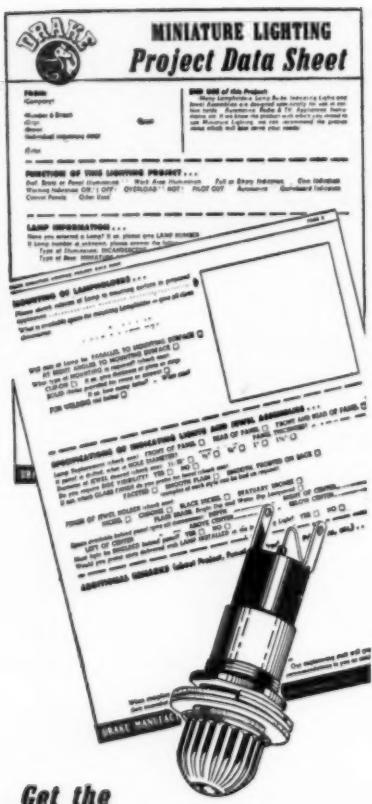
VITREO facilities help you meet the ever-growing demand for porcelain enameled parts by:

1. Acting as a source for stamping as well as enameling.
2. Enameling stampings of your manufacture.
3. Supplementing your own enameling plant.
4. Possibly saving die costs.
5. Quickly solving your color problems.
6. Keeping transportation costs low. (By operating our own trucks, we can often pick up and deliver at the same time, thereby saving most of the cost of one-way transportation.)

**VITRED**

**VITREOUS STEEL PRODUCTS CO.**

BOX 3991 • CLEVELAND 20, OHIO (Factory at Nappanee, Indiana)



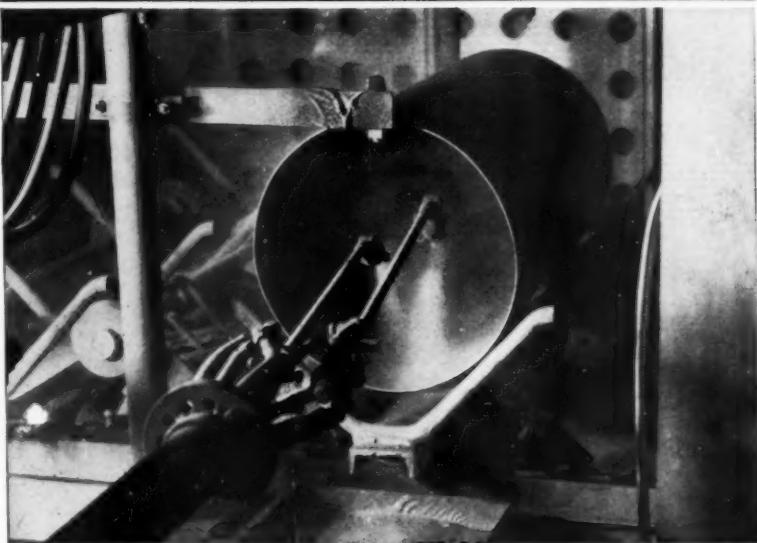
**Get the  
RIGHT Data . . . the  
RIGHT Ideas . . . about YOUR  
MINIATURE LIGHTING**

Here's the scientific way to approach Miniature Lighting. Just fill in basic questions on Drake's new PROJECT DATA SHEET, and mail it back. Our expert engineers will scientifically analyze your data . . . from all the thousands of possible lighting arrangements, will recommend the one best for top results, greatest economy, in your specific case. Drake's decades of specialized Miniature Lighting experience, and complete line of regular and special units, are thus at your disposal. This service is free—no obligation.

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MANUFACTURING  
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**Socket and Jewel  
LIGHT ASSEMBLIES**

## WHAT'S NEW in automatic finishing



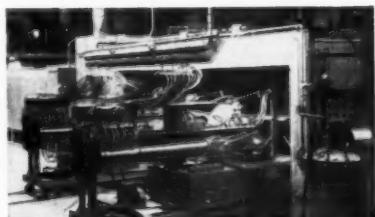
These Binks Model 21V automatic spray guns reach deep into the steel tanks on muscles of steel...apply smooth uniform coating of "glass".

## Binks guns automatically spray glass linings in Rheem tanks

Rust and corrosion have long plagued the owners of water heaters. To lick this problem, the Rheem Manufacturing Company, world's largest maker of automatic storage water heaters, developed Rheemglas. Rheem literally lines these new tanks with glass. It is sprayed on in the form of a slip, made from a special frit and is later fused with the metal walls of the tank at 1600° F.

To produce these superior tanks in quantity and at reasonable manufacturing costs, Rheem engineers rely heavily on the latest techniques of mass production. Equipment was developed, with the help of Binks engineers, to apply the glass linings automatically.

A long reciprocating arm pushes Binks Model 21V automatic spray guns deep into the tank. The guns turn on and off automatically and



Overall view of automatic machines.

coat the inside of the tank quickly and uniformly. Flues are coated separately on Binks vertical reciprocating machines.

Installations of this kind show what can be accomplished when plant engineers utilize the knowledge and experience of specialists. Binks engineers have worked closely with leading manufacturers for over 50 years. The knowledge they have gained is yours for the asking.

**Binks**  
EVERYTHING FOR  
CERAMIC FINISHING

128-55

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY



SPRAY BOOTHES



COMPRESSORS



FREE INSTRUCTION

**Binks Manufacturing Company**

3122-40 Carroll Ave., Chicago 12, Illinois

DIRECTORY

# D-ENAMELING

**is more economical  
than ever . . .**

Once D-Enameling was a temporary expedient which appliance manufacturers used to stretch critical steel supplies, but that day is gone! Now, America's leading appliance manufacturers consider D-Enameling a permanent part of their manufacturing picture. D-Enameling has come of age . . . has assumed its role as a routine step in appliance manufacturing. The reason is simple — D-Enameling transforms scrap loss into profit dollars.

**THESE INDUSTRY LEADERS KNOW FROM  
EXPERIENCE THAT D-ENAMELING TRANSFORMS  
SCRAP LOSS INTO PROFIT DOLLARS**

ARROW SIGN CO. • BRIGGS MANUFACTURING COMPANY • CAPITAL AIRLINES • CHALLENGE STAMPING & PORCELAIN CO. • CLEVELAND-TENNESSEE ENAMEL COMPANY • CONLON-MOORE CORPORATION • CRIBBEN AND SEXTON COMPANY • CROWN STOVE WORKS • DWYER PRODUCTS CORPORATION • ESTATE HEATROLA DIVISION • FLORENCE STOVE COMPANY, KANKAKEE • GIBSON REFRIGERATOR COMPANY • GLOBE AMERICAN CORPORATION • GRAY & DUDLEY CO. • ICE COOLING APPLIANCE CORPORATION • LAWNDALE ENAMELING CO. • A. J. LINDEMANN & HOVERSON COMPANY • MAGIC CHEF INC. • MALLEABLE IRON RANGE COMPANY • MAYTAG CO. • MURRAY CORP., SCRANTON • NORGE DIVISION, EFFINGHAM • NORGE DIVISION, MUSKEGON HEIGHTS • PRENTISS WABERS PRODUCTS CO. • GEO. D. ROPER CORPORATION • RHEEM MANUFACTURING CO. • SAMUEL STAMPING & ENAMELING CO. • A. O. SMITH CO. • THE ENAMEL PRODUCTS COMPANY • TYLER FIXTURE CORPORATION, WAXAHACHIE • WHIRLPOOL CORPORATION, CLYDE DIVISION

\*D-Enameling is a patented process.



## New Process *D-Enameling* Corp.

Highland and New Haven Avenues • Aurora, Illinois



Zinc Die Casting—  
Commercially Trimmed

Aluminum Die Casting—  
Commercially Trimmed

Aluminum Permanent-Mold  
Casting—Machined & Velvaglazed®

## Want more casting value per dollar?

Monarch pioneers in casting progress. Our casting and finishing facilities, unique in the industry, produce unusual casting performance. The job your casting must perform is economically accomplished with jobs we perform on the casting.

*Illustrated are a few major industries capitalizing on Monarch's ability to guarantee top-value castings at factual, low end-cost.*

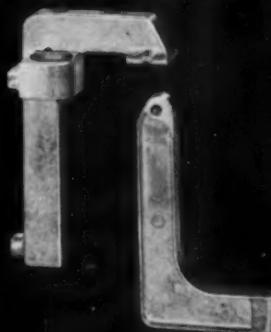
**MONARCH**  
**ALUMINUM**  
PIONEERS IN CASTING PROGRESS

**MONARCH ALUMINUM MFG. COMPANY**  
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Aluminum Permanent Mold  
Casting—Velvaglazed®

Aluminum Die Casting—  
Commercially Trimmed

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January • 1956

SPECIAL  
RHEEM SECTION

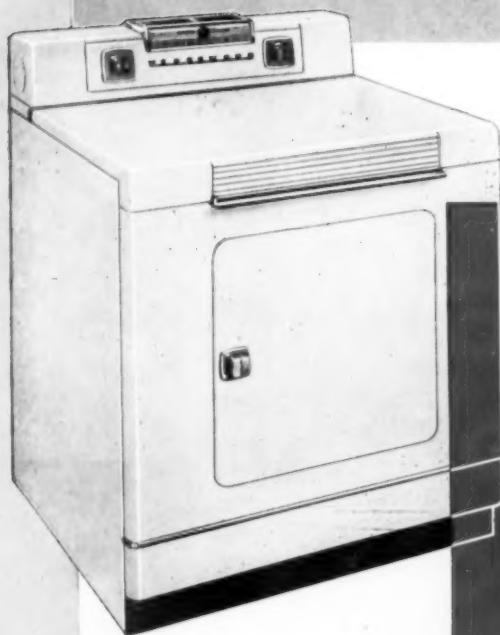
finish

THE MAGAZINE OF  
*Appliance* AND  
Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

**LUX**

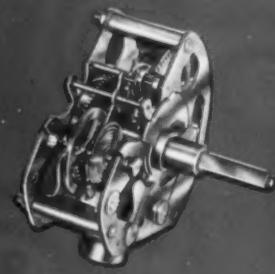
Contributes to another  
Quality Product . . .



the **RHEEM DRYER**

**LUX MINUTE MINDER MOVEMENT**

Standard 2 screw mounting accurately positions zero point. Lantern type pinion gear minimizes friction . . . is self-cleaning.



Long lasting, proven lever escapement principle of operation utilizing balance wheel, hair-spring and lever.

Solid mechanical reliability (rejections less than one-half of 1% over a period of many years).

15 minute to 4 hour interval.

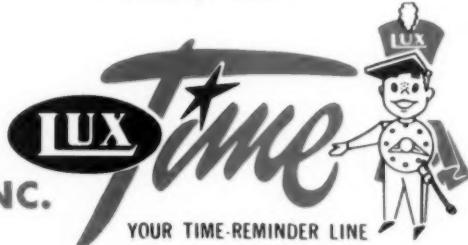
Available with or without melodious bell chime.

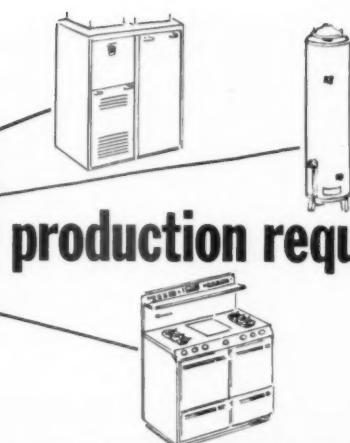
Realizing that any appliance is only as good as its components, Rheem relies on LUX 1600 Series Timers to insure continued satisfactory operation of their dryers . . . to protect their reputation as a manufacturer of quality products.

LUX timers combine latest engineering design incorporated into proved-in-use construction that assures long years of service in any appliance that requires timing. To insure the quality of your products, call on LUX experience for assistance on your timer problems.

DEPARTMENT F  
**THE LUX CLOCK MFG. CO., INC.**  
WATERBURY 20, CONNECTICUT

For information on how LUX Timers can protect your product's good name, write today to Dept. F, Lux Clock Mfg. Company, Waterbury, Conn.





production requires **QUALITY** in **QUANTITY**

**CLEVELAND FOUNDRY delivers both!**



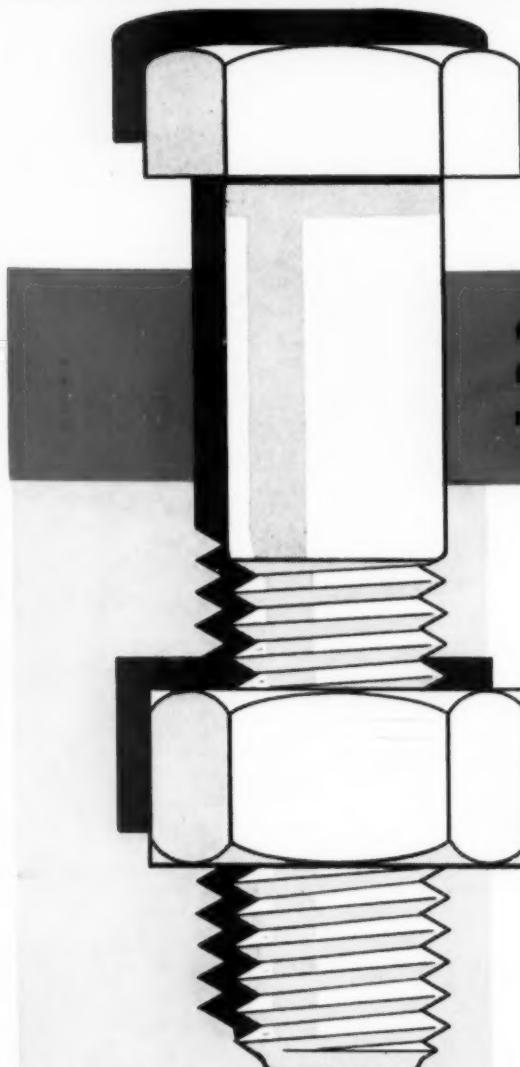
■ The fine quality of Rheem products is an accepted fact throughout the world today. Millions of Rheem appliances giving steady dependable performance are constant proof of their excellence. Yet, producing continuous high quality in almost limitless quantities takes more than just wishing — it requires specialized experience and extensive facilities.

As a supplier of many different types of castings to Rheem, Cleveland Foundry Company meets both requirements — *quality and quantity!* One of the largest job foundries in the midwest, Cleveland Foundry Company offers over 75 years of specialized experience in the volume production of light gray iron castings, and both sand and permanent mold aluminum castings for the appliance industry. When your production depends on service — when your reputation depends on quality — you can always count on Cleveland Foundry. Write for additional details.



**CLEVELAND FOUNDRY COMPANY**

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CLEVELAND 5, OHIO  
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for the manufacture of precision quality fasteners. All types and materials of screws, nuts, bolts, etc.



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Universal offers a single, dependable source for all types of fasteners. Yes, a complete inventory of all types of fasteners as well as facilities to quickly manufacture items made to order. Let us show you that we can furnish QUALITY MATERIAL and the FINEST SERVICE available at COMPETITIVE PRICES.

Specialists in fasteners for the appliance industry.

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204 Broadway  
Broadway 2-1650

# THE RHEEM STORY

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### KEY MANAGEMENT GROUP

W. S. Rheem, II
Vice President & General Manager
G. W. Mallatoff
Vice President, Secretary & Treasurer
V. J. Heinis
General Manager, Rheem Products Division
S. S. Battles
General Manager, Major Appliance Division
F. G. Fisher
General Manager, Automotive Division
J. F. Taggart
General Manager, Government Products Division
J. L. Mechem, Jr.
General Attorney
R. G. Belete
Director of Industrial Relations
R. T. Stroup
Director of Business Research
G. J. Papas
General Manager of Purchasing
H. W. Wright, Jr.
Director of Public Relations

### Editor's Note:

In over 12 years of publication, *finish* has presented only six similar complete special sections devoted exclusively to individual companies in the field of FABRICATED METAL PRODUCTS. One of these covered an unique application of steel in the building field; four were devoted to outstanding plants and organizations in the home appliance field; and one to a manufacturer of automobiles.

This seventh in the series covers a company that is the Number One user of steel in the metal products field outside of the automotive industry — a company that manufactures a broad group of fabricated metal products including several major home appliances.

Our editors feel that there should be material of interest in this section for every fabricator and producer of metal products.

In the development of this special section, the editors of *finish* consulted with top management at Rheem and worked in Rheem plants from the East to the West Coast.

Due to the size of the organization and the number of plants involved, it is impossible in this note to give individual credit to the many executives, engineers and plant men who gave editorial cooperation. Therefore, it is the purpose of this message to thank the key personnel at Rheem as a group for their generous cooperation.

This special 56-page Rheem section forms the center of a 128-page January 1956 issue of *finish* magazine.

Copyrighted in January 1956 *finish*.

Dana Chase Publications, Elmhurst, Illinois

PRINTED IN U. S. A.



### HISTORICAL SKETCH OF RHEEM

HERE are some of the highlights in the Rheem growth picture.

1925 — Three Rheem brothers form Pacific Galvanizing Company. First year sales: Less than \$100,000.

1926 — Rheem begins fabricating steel drums.

1930 — Company begins its corporate existence as original co-partnerships are merged with acquired assets to operate two northern California plants.

1931 — Rheem expands and takes its first steps toward diversification and decentralization by acquiring John Wood Manufacturing Company of California for the manufacture of water heaters.

1937 — Rheem expands — West to East — opening plants in Texas, Ohio and New Jersey. This same year marks first expansion abroad with an Australian subsidiary opening a plant in Sydney to produce steel shipping containers and household appliances.

1941 — Company becomes the largest U. S. manufacturer of steel shipping containers and automatic water heaters; today it is the world's largest. Sales: \$19,500,000.

1941-45 — Rheem becomes a major producer of military products. Seven plants win Army & Navy "E."

1945 — Expansion of foreign interests begins with the opening of two plants in Brazil. Rheem International today encompasses six plants in Australia and other facilities in Canada, Singapore, Argentina, Peru, Brazil, England and the Philippines.

1947 — Rheem purchases the Frazer line of warm-air heating equipment.

1950 — Management begins re-tooling for military production; three new plants are started. Sales: \$74,465,000. (25th year — sales up from \$100,000 in 1925.)

1951 — Rheem enters major appliance field by acquiring Wedgewood gas range.

1953 — Highest year of sales — \$188,000,000.

1954 — Rheem purchases U. S. Spring & Bumper Company and forms Automotive Division.

Invests more than \$3,000,000 in new facilities for the manufacture of glass lined water heater tanks.

1955 — Significant contracts received for production of a proprietary item, the gunnery trainer, and for control parts for the F-100 Super Sabre, and for critical parts for the J-57 jet engine.

Rheem acquires certain patent rights to air conditioning process formerly owned by Ultrasonic Corp. of Cambridge, Mass.

1956 — This year the company will open its \$6,500,000 Rheem Automotive Company plant in southern California.

## Better Porcelain Enameling Starts Here

The "art" of porcelain enameling has become a modern, continuous-flow production process, making possible better and better home appliances at ever lower relative costs.

In Rheem's three new facilities for the porcelain enameling of water-heater tanks, for instance, many of the latest automation devices save time and money, while electronic controls assure the highest standard of quality and uniformity in the finished products.

Designed and built by Ferro, Rheem's "model" porcelain enameling plants started with miniature models such as you see

below. Into them has gone the know-how and experience of 35 years of industry leadership, during which time Ferro has built nearly 90% of all modern porcelain enameling facilities.

Naturally, we are proud and happy to have shared with the Rheem organization another major advance in the production of better home appliances.

In porcelain enamel, you have the ultimate in protective finishes . . . and in the new Rheem Water Heaters, a line of products you can sell proudly.



**FERRO CORPORATION**  
*Engineering Division*  
4150 EAST 56th STREET • CLEVELAND 5, OHIO



## Our management philosophy

by *W. S. Rheem II* • VICE PRESIDENT AND  
GENERAL MANAGER, RHEEM MANUFACTURING COMPANY



Behind the growth of every industrial organization lies a significant story. Rheem's story can best be told in terms of a management philosophy which has created an "atmosphere of growth" in the company.

As we see it at Rheem, top management's prime functions are coordination, control and long-range planning. As a matter of policy, line responsibility

is broadly delegated. This reduces the authority for decision-making to a workable common denominator.

We seek to manage by coordination rather than by directive. Generally speaking, operating decisions are made by the corporate management only where two or more of the company's four operating divisions are involved or where the corporate financial structure is substantially affected. Outside these areas Rheem managers are largely "on their own", and are given at each

operating level an opportunity for self-expression and a voice in the business.

Delegation of authority means that decisions are made where they count most — where the resulting action occurs. Delegation of authority encourages people to work out answers for themselves. At Rheem we have found that they almost invariably reach the same conclusions as top management on any given set of problems. We've also found that in a very real sense they arrive at *better* answers because they have solved their own problems.

From the day our company was founded in 1925, Rheem has been expansionist minded. This urge to expand has been infused into all levels of management, and individual managers constantly are encouraged in their eagerness to grow — personally and in areas of responsibility — with the organization.

Growing space for the company and its people has been gained by management's insistence upon a logical progression (by market) in its expansion — moving into manufacturing operations and lines of products which complemented the existing markets for the company's products.

Manufacturing know-how has been essential in the total concept of Rheem growth. We have always had the men, machines and equipment to do the best job. But it is not enough to be skillful at producing goods. In this competitive world you must be skillful in selling them, too, and Rheem has worked hard to keep its marketing strength on a par with its manufacturing ability. Our continuing, intensive program to this end includes four basic elements:

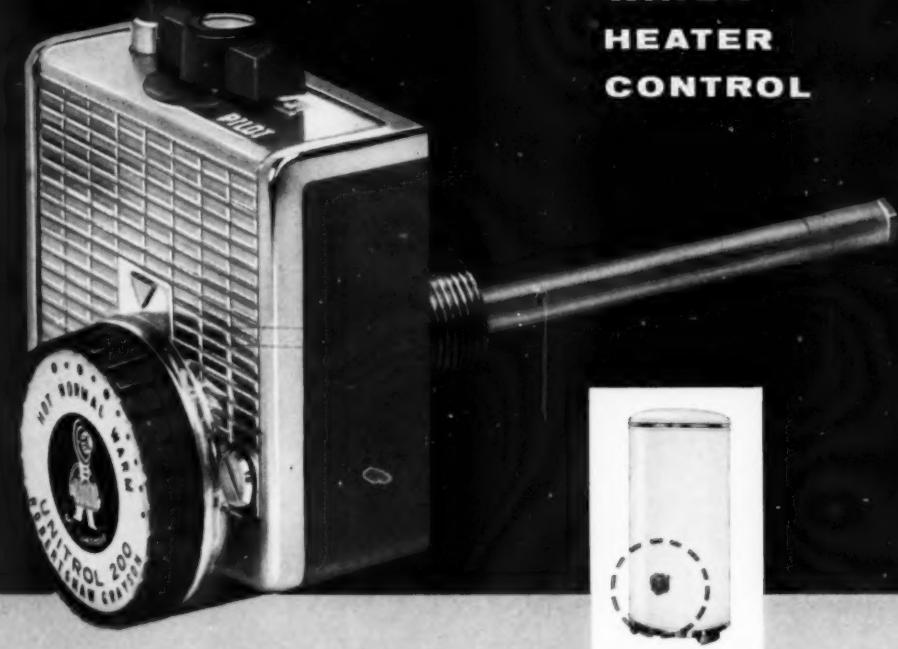
1. Constant study of markets for present and potential products.
2. Continuing re-analysis of production facilities in relation to new-found facts about Rheem markets.
3. Constant updating of our thinking in terms of advertising, merchandising and public relations.
4. Use of outside marketing-management consultants.

As might be expected of a young company, Rheem boasts one of the youngest management teams in industry. It is a strong, aggressive team that is quick to learn and apply its lessons. It is a dynamic team that will grow and prosper with a rapidly expanding company. With such a team, the *status quo* belongs to yesterday.

There's everything you'd expect of a  
Robertshaw-Grayson product in

# NEW UNITROL® 200

WATER  
HEATER  
CONTROL



**UNITROL 200** features include dust-proof filter; air-gap construction; gas valve body of special aluminum alloy to resist gas corrosion; immersion parts of red brass and copper to resist water corrosion.

**EYE-APPEAL** that gives water heaters added sales appeal

**STYLING** that permits concealed or flush-on installation

**COLOR** that harmonizes with metal trim and available in several finishes

**EASE OF SERVICING** that's as simple as one-two-three without breaking connections

**FINEST PERFORMANCE** that's traditional with UNITROL Water Heater Controls



*Robertshaw-Fulton*

CONTROLS COMPANY

Grayson Controls Division, Long Beach, California  
Robertshaw-Fulton Controls (Canada) Ltd., Toronto

## Marketing and merchandising . . .

by C. V. Coons • VICE PRESIDENT



The basic approach to selling its products certainly is one of the determining factors of success in any growth company. The Rheem approach has been rather consistent since the days when the company consisted of one small plant in the San Francisco area.

During the 30 years of our company history a constant process of learning has been a foremost part of our marketing and merchandising.

Today, as before, our sales and merchandising people are seeking information and facts about the customers they serve, how our products perform, how they can be improved, how our sales policies can be constructively improved, and scores of other things that help us do a better job for our customers and their customers.

To use this continuous flow of knowledge, Rheem has depended on the vigor of youth — that is, both young men and men who remain young in their thinking. In our four divisions the sales job is being accomplished by youthful men with imagination — who are eager to learn and to apply their knowledge.

While this fact applies equally to the Automotive, Government Products and Wedgewood Divisions of our company, it can more clearly be expressed through the following remarks concerning the Rheem Products Division, our largest. For here is the facet of Rheem

that reaches the greatest number of customers, the largest array of industries.

### Rheem products for industry

The principal industrial section of the Rheem Products Division is devoted to shipping containers, primarily for products sold to industry. Shipping containers consist of steel drums and pails and fibre drums.

In this realm of activity the Rheemcote drum is perhaps our best known packaging product. It is the attractive steel drum — most frequently 55-gallon capacity — that is lithographed in multi-colors. Intricate subjects, such as photographs of automobiles, vegetables in full color and authentic product trademarks are lithographed on steel, before it goes to the drum fabricating lines. It then becomes, instead of just a drab shipping container, an attractive advertising medium — a round billboard.

To sell Rheemcote drums, Rheem people must learn much about many industries and their products and thereby assist the customer in obtaining the most effective and economical container for his product. Therefore, as our

sales personnel use what they learn in their activity, they actually serve as "merchandisers of merchandising."

### Rheem products for the homeowner

Here again experienced Rheem people work on the job of making Rheem products flow efficiently from Rheem plants to millions of American home owners. To provide homes with such important equipment as water heaters, warm air furnaces and central air conditioning, our merchandisers must work constantly for a delicate balance between *selectivity* and *saturation*.

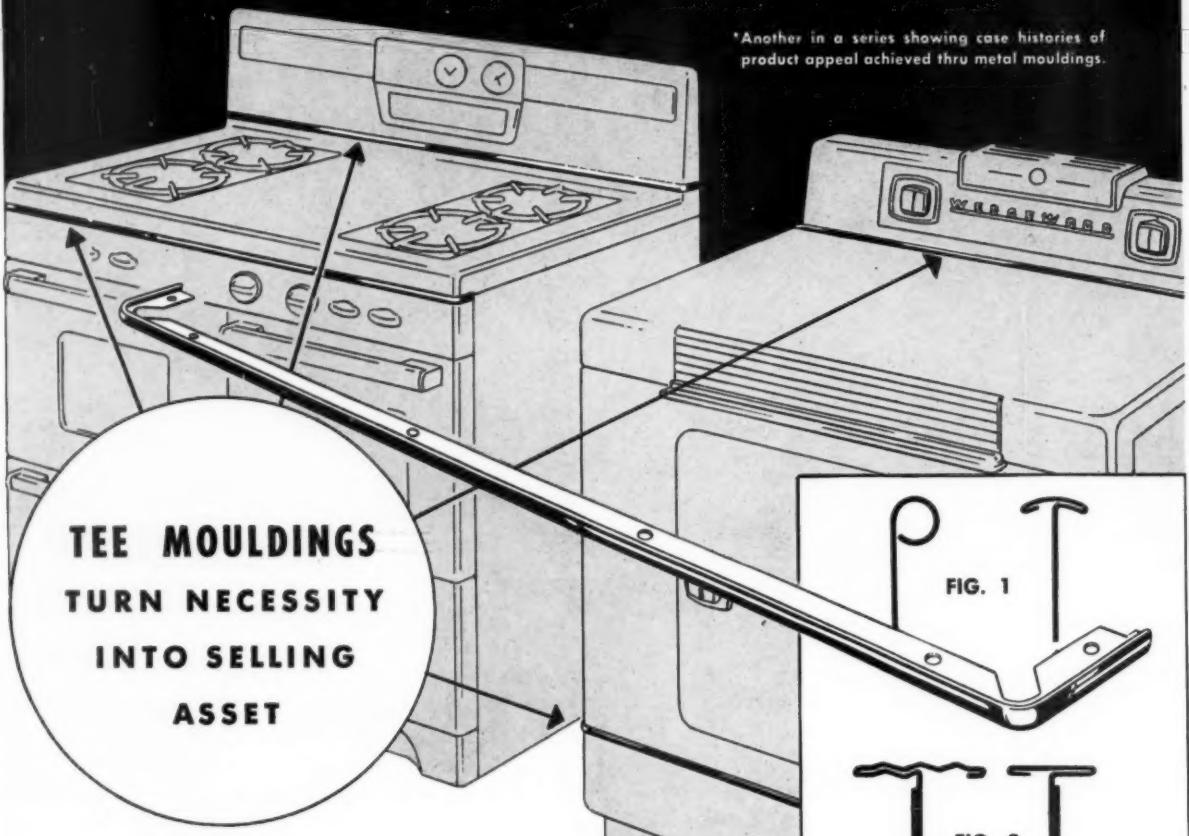
The Rheem plumbing and heating sales organization, therefore, works constantly to select and support the sales efforts of able, alert wholesalers who, in turn, make the same kind of selection of competent, aggressive dealers. For at Rheem, our philosophy is that efficient distribution is essential if we are to win and keep the loyalty of Mr. and Mrs. America.

The constant improvement in sales results indicate that Rheem people in marketing and merchandising are on the right track. We believe, furthermore, that they will continue to make gratifying progress.



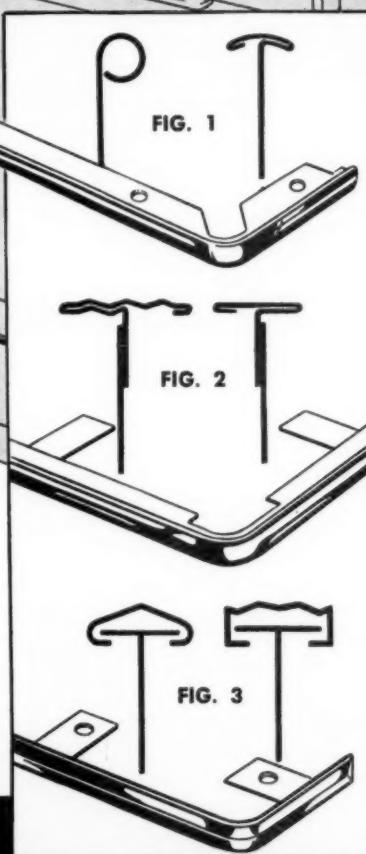
# sparking sales with **STAINLESS\***

\*Another in a series showing case histories of product appeal achieved thru metal mouldings.



**TEE MOULDINGS  
TURN NECESSITY  
INTO SELLING  
ASSET**

Manufacturing necessities can be turned into selling assets. PYRAMID Tee Mouldings are easily fitted between panels required in most appliance construction—thus hiding ugly seams and adding Sales Spark. (fig. 1) Many standard tee mouldings are available in various designs and face widths . . . Formed with flanges notched and pierced to exact requirements. (fig. 2) Long tabs spot welded to leg of standard section, engineered to meet your specific application needs. (fig. 3) Low cost stock "snap-on" mouldings are simple to install with the use of T type clips. Write or call today for more information concerning these and other versatile methods of adding sales appeal.



**Pyramid Mouldings Inc.**

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## Organization for engineering and manufacturing . . .

by *L. W. Evans* • VICE PRESIDENT

Exclusive  
feature  
**finish**

In order to understand how our manufacturing department operates, it is necessary to look at Rheem's organizational structure and

study its functions. The corporate manufacturing office acts in a staff capacity. It is responsible for screening requests for capital expenditure, reviewing soundness of manufacturing programs and controlling the fixed assets inventory. It makes plans for optimum facility utilization and coordinates inter-division engineering and manufacturing programs.

Rheem has decentralized the balance of its manufacturing management responsibility into product divisions. Each of the four divisions has its own product research and development groups. The activities of these development groups are closely keyed to marketing requirements, for assuring modern, high-quality products.

Each of the 14 Rheem plants has its own plant engineering department. These departments are staffed by young engineers who are well equipped to

tackle the toughest facility engineering assignments. The reason for this broad delegation of responsibility is simple — it is at the plant level that good production performance must be demonstrated and from which profits must be derived.

Similarly, each plant maintains its own autonomous industrial engineering department. Methods improvement and engineered production standards are essential to profitable operation.

These two key plant engineer groups, teamed with plant production management, have been instrumental in developing (in cooperation with equipment service engineers) the many complex but highly effective manufacturing processes the company boasts today.

When a new product or process is developed, and it is determined that the market will support new facilities at more than one plant, the division and corporate facilities engineering groups enter the picture. What is best suited to one plant may be entirely out of place in another. On the other hand, sound procurement principles dictate that performance specifications be simi-

lar for reasons of economy. It is here that the general manufacturing and engineering offices perform their critical coordinating function.

Rheem, like many other companies, has recently become more aware of the necessity for a well-planned maintenance program in each of its plants. Production efficiency on a highly mechanized line is directly proportional to the ability to keep the equipment operating smoothly and continuously. The answer is found in a strong preventative maintenance program incorporating the principles of regular equipment and repair, together with periodic overhauls. Inasmuch as the concept transcends divisional lines, the corporate office has provided the planning and impetus to get the program started.

Because basic principles of production control are common to most of our product lines, the corporate manufacturing department is conducting a detailed study to further help individual plants with their scheduling problems. Standards are being set up by which all production control departments throughout the company will function. The department will coordinate implementation of this program on completion of the planning phase. However, responsibility for economical scheduling of the company's production facilities must rest at the plant level.

Our manufacturing people have become proficient in the art of problem-solving and understand the importance of teamwork. They believe in Rheem and are proud to be a part of its growth.

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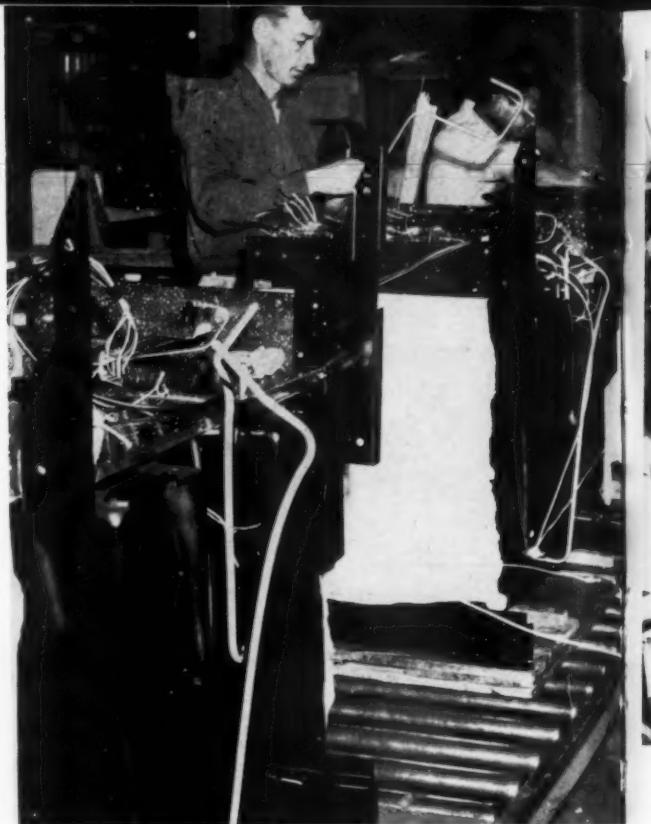
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## Range production at Newark

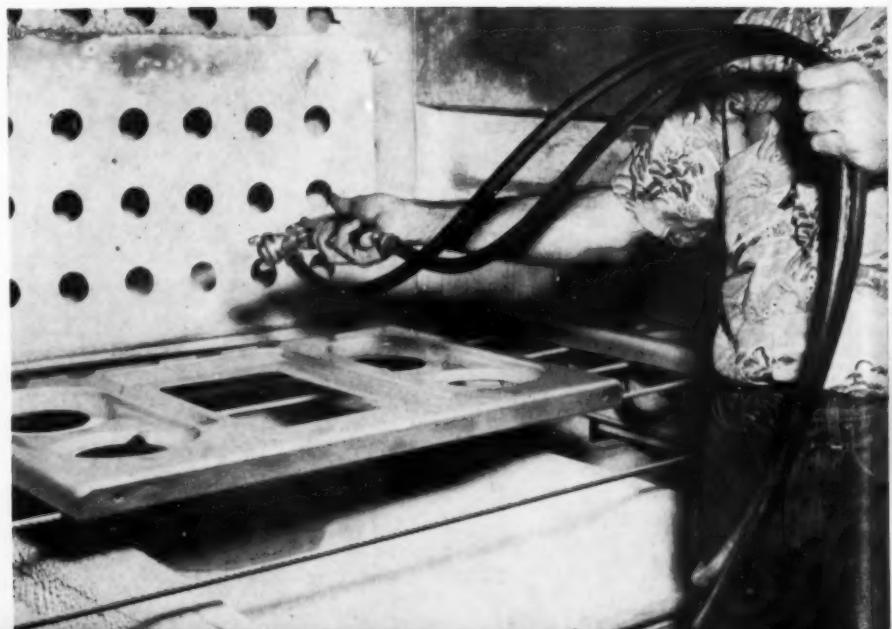
WEDGEWOOD ranges and the recently-introduced Royal ranges are produced in Rheem's Newark, California, plant. The accompanying photographs and captions illustrate and describe some of the operations involved in the production of these appliances.



Above: To obtain a gleaming chrome finish on Wedgewood top panels the bare metal must be polished, copper applied and buffed before nickel and chrome coats are added. Here, a workman has just removed a bare metal top from an automatic top polisher. He is about to run the part through another polisher to smooth the edges.



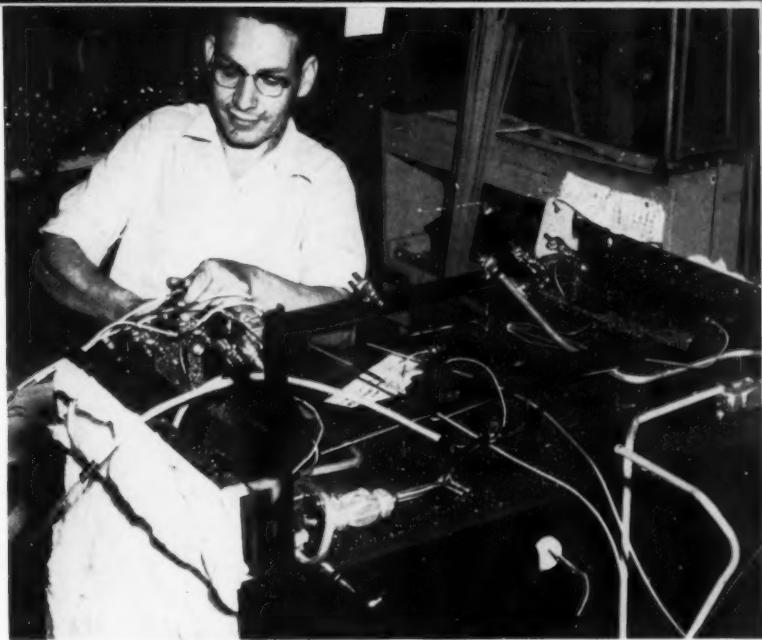
Above: Aluminum tubing, which will connect the burner control with the oven burner unit, is installed about half-way through the assembly operation. Next, porcelain enameled side panels will be added to the range chassis.



Below: A top which has just left an automatic spraying booth where white titanium porcelain enamel is applied. The workman makes sure the porcelain has been applied properly and checks edges of the part to assure a uniform thickness.



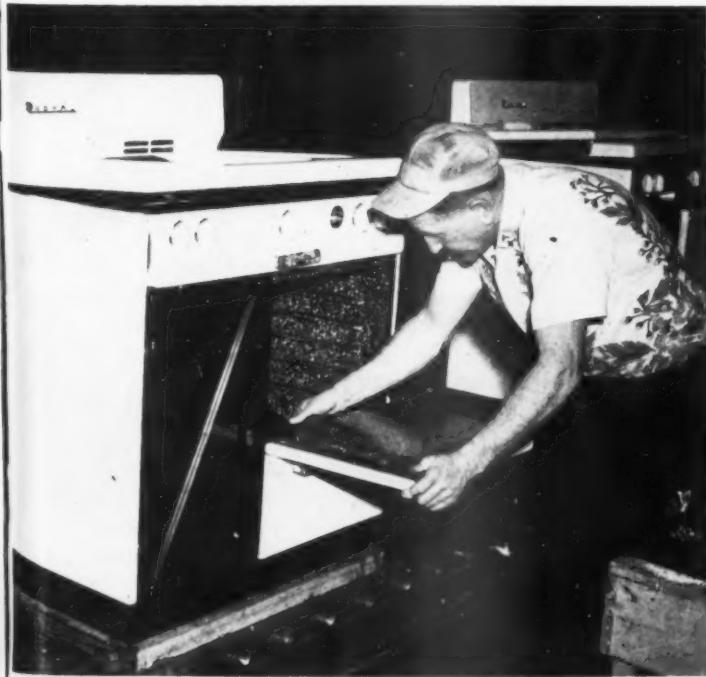
Above: Once the parts have been formed, cleaned and pickled, they are ground coat dipped and hung on these moving hangers. From here the parts travel through the dryer and then to the enameling furnace.



Above: After the chassis has been put together and burner controls installed, a skilled workman begins installation of the wiring harness.

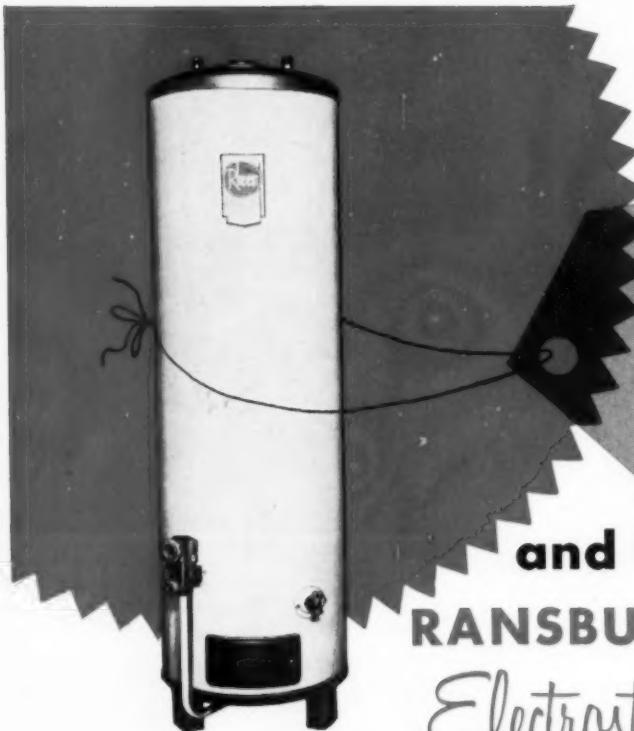
Right: Automatic top lighting units are being installed during an assembly operation on one of the Rheem Royal assembly lines. Spun fiberglass insulation seen in the picture was placed on the range immediately prior to this step.

Below: Separate lines are used to assemble recently-introduced Rheem Royal gas ranges. Here, toward the end of the assembly operation, a worker installs a fully insulated oven door.



Right: Finished Wedgewoods are prepared for shipment at the end of the assembly line. Immediately prior to this phase each range is carefully inspected. Rejects are diverted from the line, and, once repaired, returned to the inspection station.

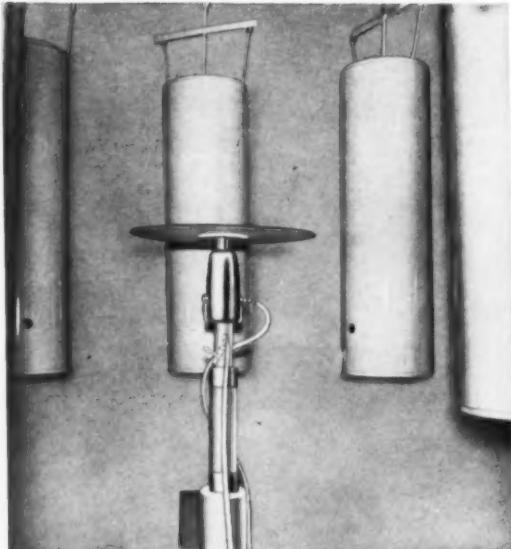




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RANSBURG

# The production of glass-lined water heaters

three plants—South Gate, Calif., Chicago, Ill., and Sparrows Point, Maryland—have parallel production facilities for turning out "frit coated" tanks in volume



It's one problem to visualize and design a new product. It's a different and often more difficult problem to get this product into speedy, efficient and economical production, especially when it involves new and untried manufacturing processes.

Rheem Manufacturing Company solved these problems in record time in setting up their glass-lined water heater tank lines in their Sparrows Point, Md., South Gate, California, and Chicago plants. In about a year after the first trial runs were made, the first of these lines was producing at substantial volume.

While Rheem has been manufacturing water heaters for years, with both galvanized and copper-lined tanks, company engineers point out that only a minimum of information and equipment could be transferred from the old lines to the new. Furthermore, the new glass lined tank lines involve manufacturing processes and techniques that were not previously used in the company's water heater production.

Speed in getting production under way was aided, first, by centralized research in conjunction with a frit manufacturer to develop and perfect an enamel frit suitable for the purpose. Secondly, production line equipment was duplicated in the three plants, thus simplifying the tooling problem. And finally, close cooperation between the three plants permitted unified effort in working out the many problems that always haunt any new production line effort.

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"Flame testing" controls for Rheemglas water heaters on the final assembly line at South Gate, California.

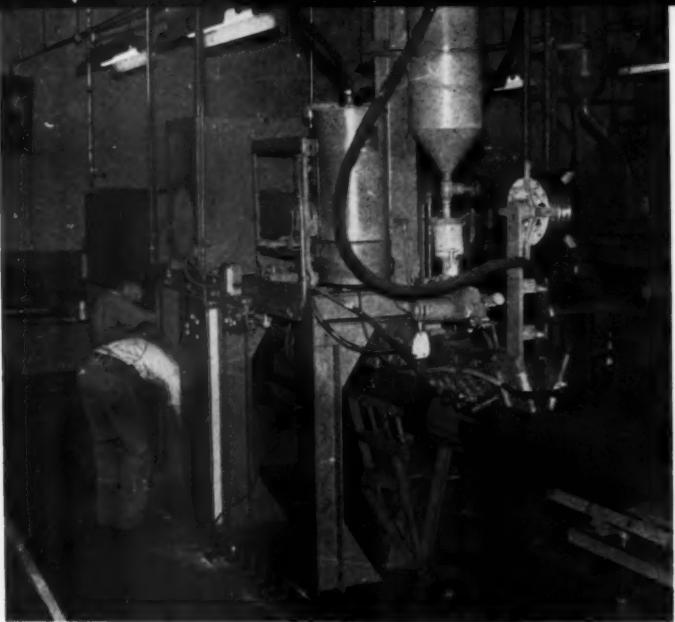
The material used in producing the glass-lined water heater tanks is hot rolled low carbon steel sheets. Some of this material is received in bundle form, pre-cut to size. Some of it requires trimming and squaring before it is used. In either case the material for the tank bodies enters the production line in bundle form and is removed from the bundle one sheet at a time by an automatic loader which places it

on the belt feed of a true circle forming roll.

## Combination roll former and seam welder

A combination roll former and seam welder completes the first operation. The formed tank body moves from the forming rolls directly onto a conveyor which carries it under a stationary-mounted submerged arc welding head.





*Combination true circle roll former and seam welder in which feed and welding are entirely automatic. (In operation the tank bodies butt together to form a continuous welding surface.)*

The timing of this operation is such that the tank bodies follow each other in continuous succession under the welding head so that a continuous weld seam is being laid at all times with no break in the welding operation. In fact, this continuous weld seam actually joins the tank bodies together and must be broken by a slight twisting motion as the bodies emerge from the welder and are transferred to another roller conveyor.

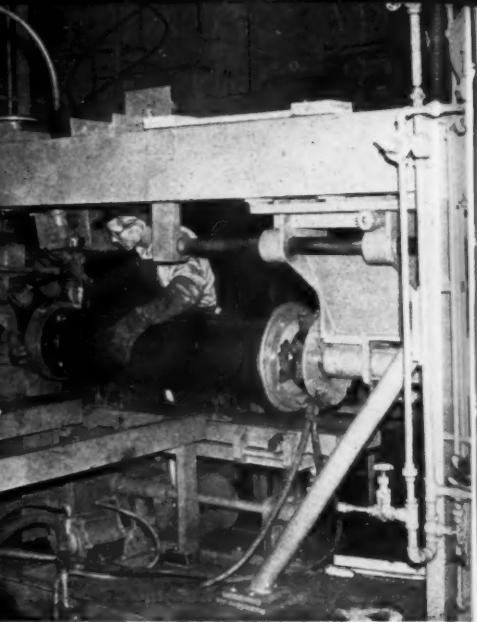
The second operation is smoothing of the interior of the weld seam so that an unbroken and continuous glass coating may be applied.

After the weld bead has been

smoothed, the various tank body couplings and nipples are projection welded in place. The tank bodies are then conveyed to a flaring machine where hydraulically actuated flaring mandrels move into each end and produce a slight flare. This facilitates subsequent mounting of the heads and bottoms.

#### **Combination head press and head welder**

Beyond the flaring machine the bodies move to a combination head press and head welder. The top of the tank is pressed into place by a hydraulic ram, then is welded by a stationary overhead

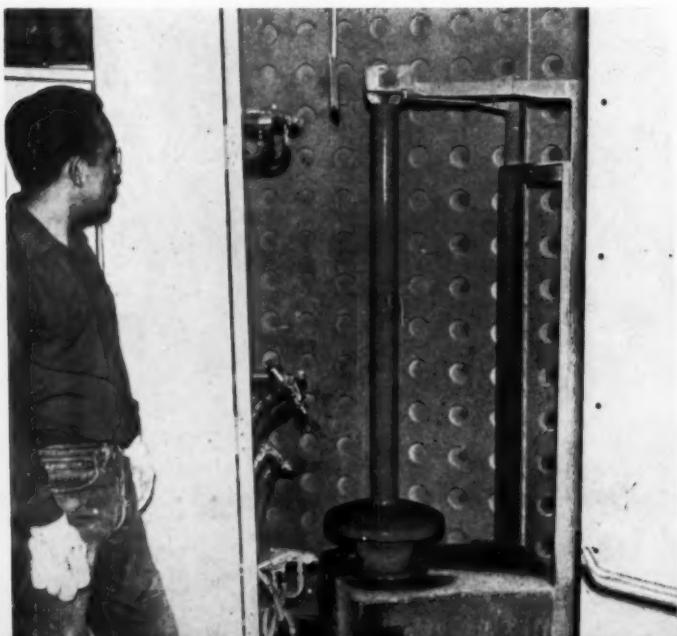


*Pressing a head onto a tank body prior to welding. The top of the tank is pressed into place by a hydraulic ram, then is welded by a stationary overhead welding head.*

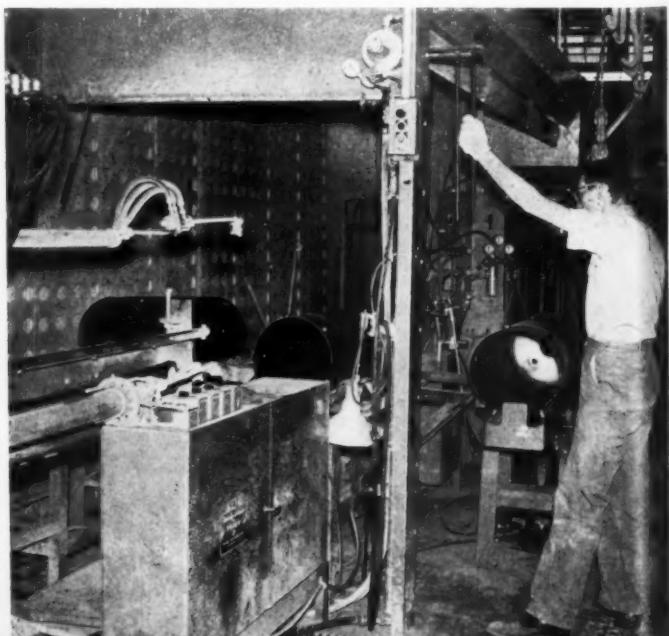
welding head while the tank revolves under the arc. The heads installed at this point move in from an auxiliary production line where staged punch press operations are used to blank, form, pierce and extrude them from sheet stock.

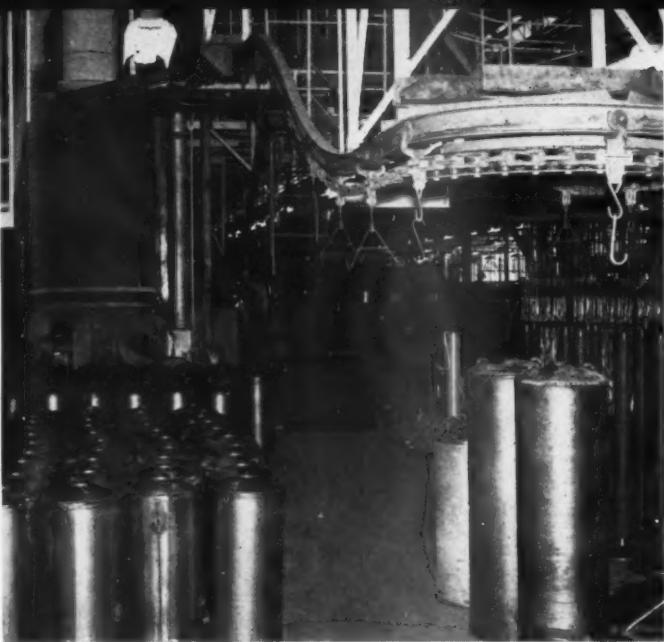
Beyond the head welder a water curtain cools the tank before it undergoes its first pressure test. During this test the open bottom of the tank is automatically sealed by a hydraulically actuated pad, while the tank is automatically subjected to 20 psi air pressure, and all seams are covered with a soap solution to detect leaks. Inspection at

*Flue and bottom assembly mounted on spinning mandrel in spray booth. Spray guns reciprocate vertically while flue assembly rotates. (see page R-50)*



*Applying glass coating to interior of tank assembly. Note spray guns (center left) which move in and out of the assembly while tank rotates.*





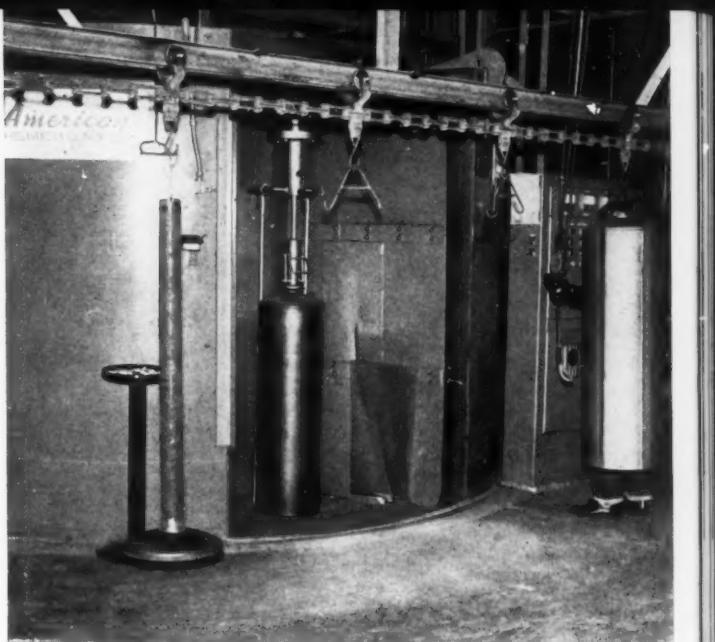
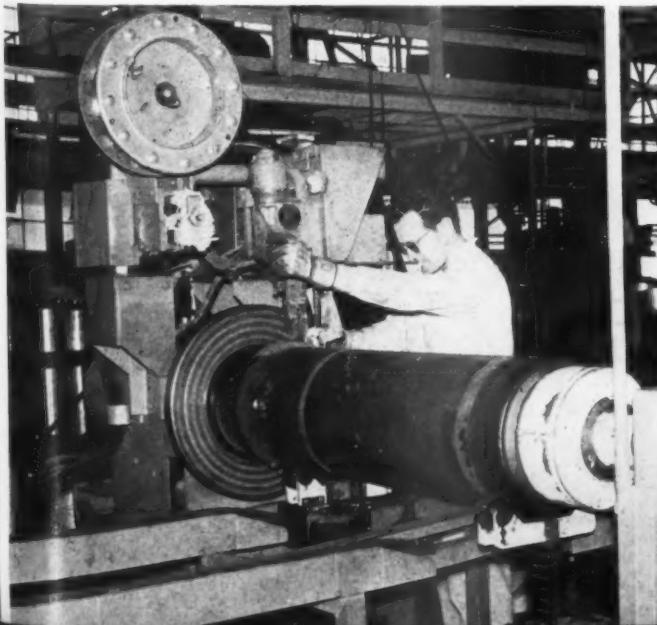
The water heater body and flue assemblies meet at this point and are hung in alternate sequence on an overhead conveyor. The assemblies travel first through the automatic cleaning chamber visible at upper left.

this point is limited to a search for leakage along the side seam and along the seam joining the top to the body.

#### Flue welding

At this point the flue and bottom assembly joins the tank body and top assembly. The flue is welded into the tank bottom using the submerged arc welding process to obtain a very smooth bead which does not require smoothing. The two assemblies are then hung in alternate sequence on the conveyor chain which carries them through the finishing processes.

Fusing water heater body, bottom and skirt together in a single welding operation. Welding heat also fuses the interior enamel lining into a continuous glass coating at the juncture of the bottom and body.



Tank body shown in position for blasting in one of the six automatic indexing compartments in the blast equipment. Three of the compartments are tooled for mounting tank bodies; the other three for mounting flue and bottom assemblies. (see page R-50)

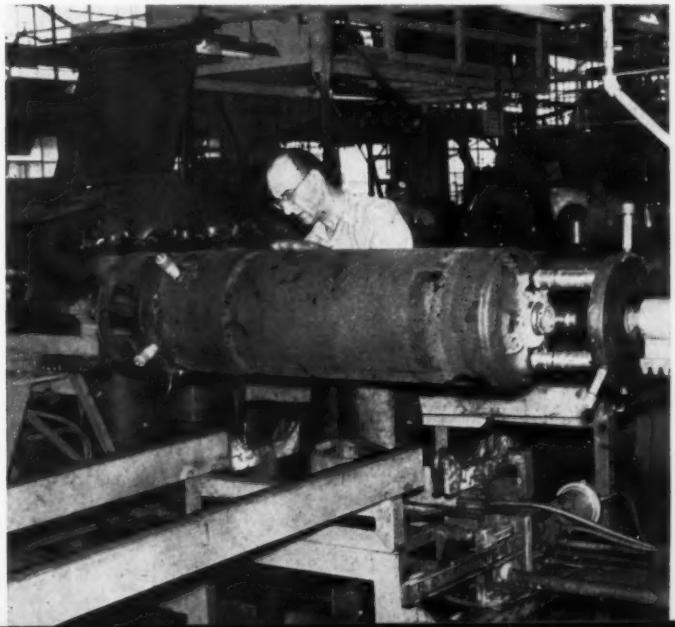
The chain travels first through an automatic cleaning setup where the components get a spray-cleaning with a hot (180°F.) alkali solution, a hot water rinse and drying. The assemblies travel next to blasting booths and are thoroughly blasted both inside and out.

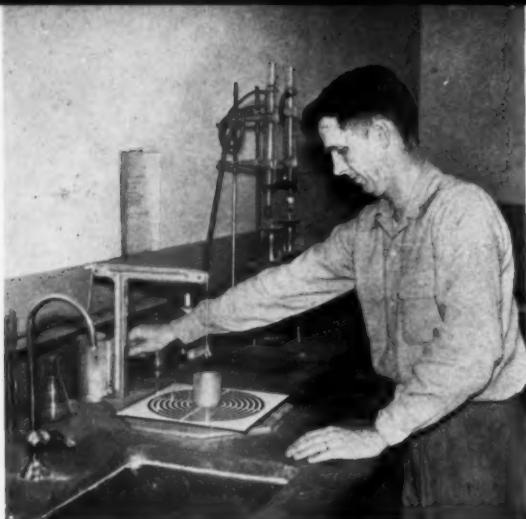
#### Special automatic equipment for glass coating

The booth where the glass coating is applied is in two sections, one tooled for spraying the flue and bottom assembly, the other for spraying both the interior and exterior of the top and tank assem-

bies. The flue and bottom assembly is sprayed by vertically reciprocating guns while the assembly rotates, and the top and body assembly rotates in a cradle in a horizontal position while spray guns mounted on automated extension arms spray the interior. The exterior of the body receives a light fog coating from another automated gun. The interior body is coated to a predetermined thickness developed to resist water corrosion. The coating on the exterior of the body is just sufficiently thick to prevent furnace scale during burning and to act as a corrosion prevention coating

Soap testing the finished water heater tank. The tank is automatically pressurized at 20 psi of air pressure. This is one of the standard quality control tests employed on the water heater tank production line.





A laboratory adjacent to the mill room provides facilities for quality control.

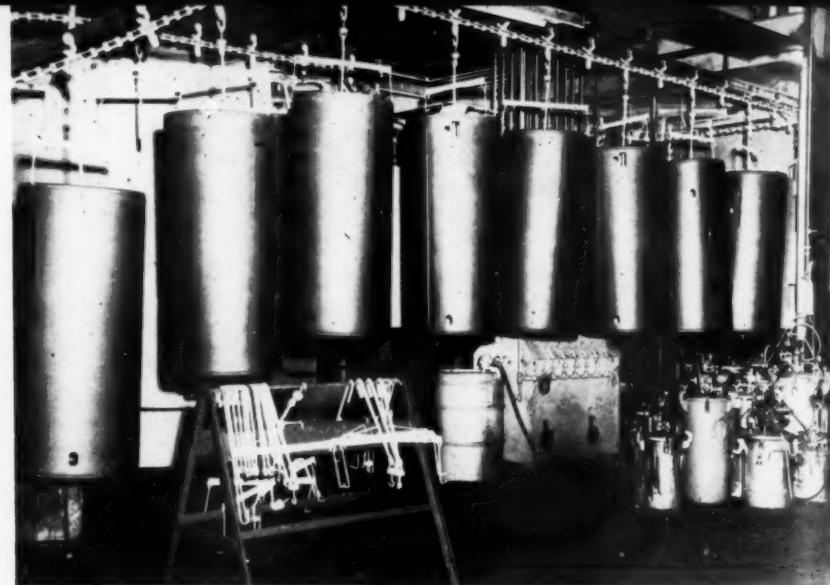
during the service life of the product.

Beyond the spray booth the glass-coated assemblies travel through a drying oven, then to the brushing department. Here the bisque is removed from a part of the flange on the bottom and for a very short distance, approximately  $\frac{1}{2}$ -inch, up inside the bottom of the tank body. This is to provide metal-to-metal contact between the bottom and the body when the bottom is welded into place.

Fusing the glass lining is accomplished at  $1600^{\circ}\text{F}$ . in a U-type gas-fired furnace. Immediately after fusing, both assemblies receive 100 per cent visual inspection.

#### Tank assembly and welding

The assemblies are now ready for the final tank assembly line. The first operation on this line is to press the bottom and flue assembly into the tank and top assembly. This is accomplished in a horizontal hydraulic press. A short portion of the bottom flange is allowed to



Electrostatic spraying area for coating water heater jackets. Clean steel jacket feed to the right into spraying area.

protrude from the tank body on which the tank skirt is mounted. The skirt is pressed upward on the bottom flange until it meets the body.

The final welding operation comes next. Here again the submerged arc welding process is used. This operation fuses the skirt, the body and the bottom in a single bead. The heat produced during welding also fuses and joins the glass coatings on the inside of the body and the inside of the bottom into a continuous coated surface over the critical joint between the bottom and body.

The glass-lined water heater tanks are then ready for jacketing, assembly of controls and other components, test pit inspection and final packaging for shipment. The body component is first

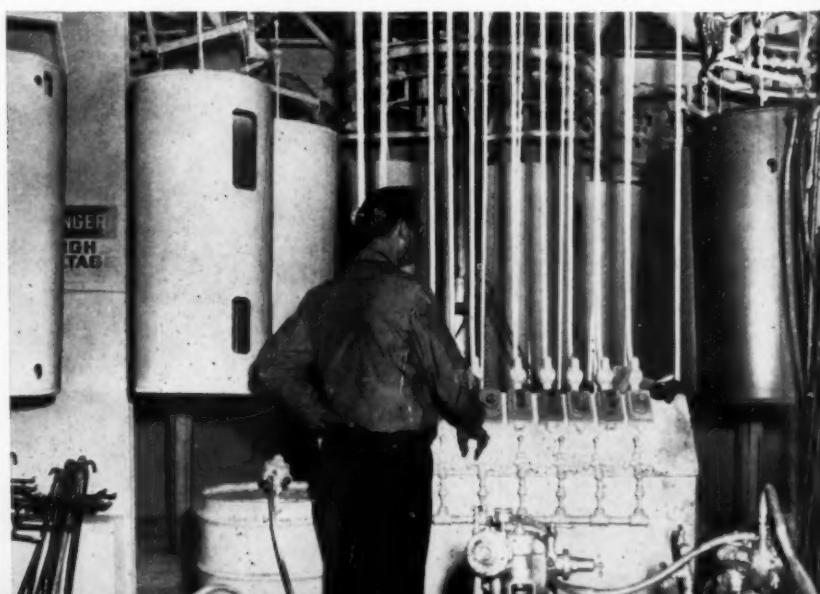
wrapped with the necessary insulation which is held in place by clamshells while the jacket is slipped into place. The clamshells are then removed, and the jacket is bolted in place. The jacketed water heater is then mounted on a crate bottom that will form a part of the finished package and is started along the assembly line. Here the burner elements, pilot lights, thermostats, tubing, etc., are installed and tested. Beyond this point the water heaters are ready for crating and shipment.

Each Rheem plant maintains its own frit milling department, using conventional ball mills for grinding. Laboratories adjacent to each mill room provide quality control in frit preparation, application and burning.

finishfoto

Center section of the electrostatic spraying area for water heater jackets shows control equipment, center, and special conveyor set up employed to use disc type electrostatic equipment. Clean parts feeding at right; painted parts emerging at left.

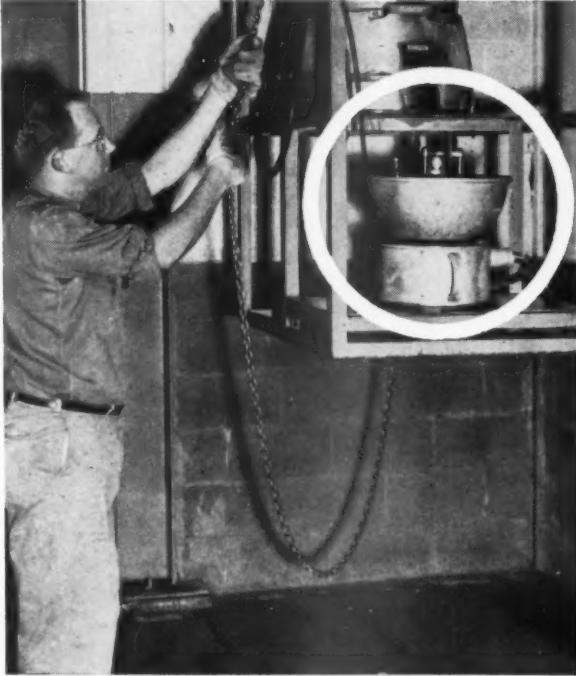
Jacketing water heater tanks just prior to final test pit inspection.



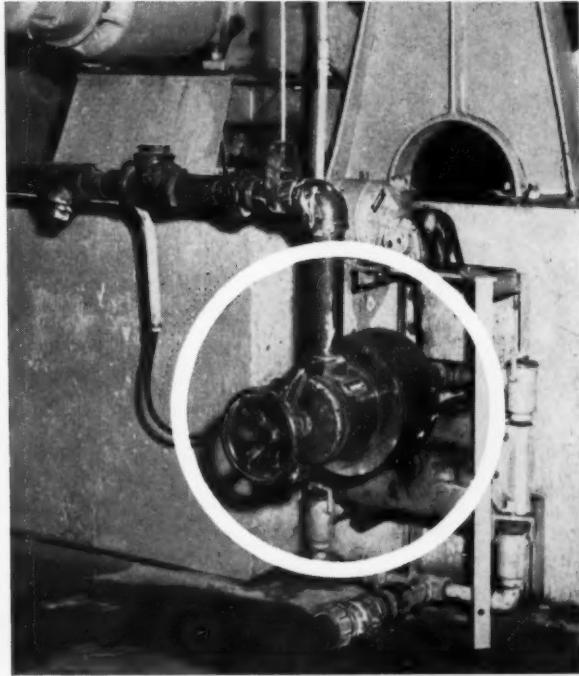
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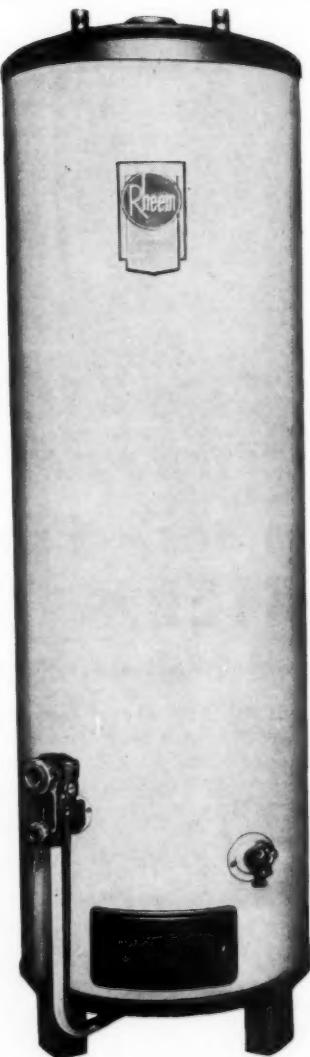
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# Fabricating copper-lined water heater tanks

research, production ingenuity and new testing procedures were required for establishing facilities for the "Coppermatic" — "tank within a tank" assembly

## finishfotos



Many years of experience in manufacturing conventional water heaters was of little help to engineers of Rheem Manufacturing Company when it came to installing the "Coppermatic" copper-lined water heater tank line in the company's Sparrows Point, Maryland, plant. The conception, design and fabrication of the copper-lined tanks is so drastically different that entirely new techniques, tooling and fabrication processes had to be researched and developed.

In conception the Rheem "Coppermatic" tank is double-walled boiler type assembly, with the inner copper tank used for corrosion prevention only, while the sheet steel outer tank provides the necessary strength, rigidity and protection. Getting these tanks fabricated, one inside the other and in an air-tight and leak-proof manner, poses some tricky problems.

### Fabricating the copper "inner tank"

The design principle of the "Coppermatic" water heater tank is relatively simple. The copper section is made up of two longitudinal tank halves silver-soldered together. The steel shell is composed of three sections — a cylindrical section which surrounds the longitudinal girth of the copper tank and two hemispherically-shaped end sections which are fitted over the ends of the copper tank and welded to the girth section.

The copper sections are press formed directly from blanked copper sheets

*After the outer steel skirt is slipped over the copper tank assembly, one steel tank end is tack welded in place. The other steel tank end is then capped in place, and the entire assembly is mounted in a restraining jig so that the copper tank can be water tested before final welding of the steel jacket.*

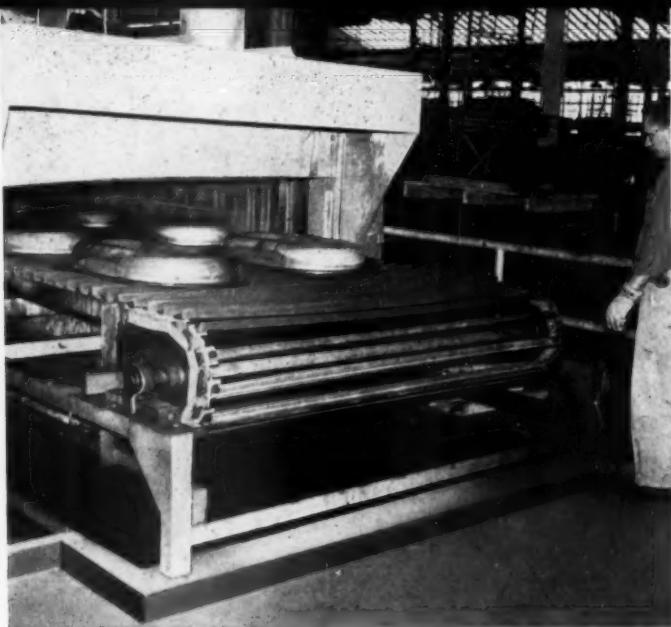
0.032-inch in thickness. Two drawing operations are used, the first to obtain optimum metal distribution around the edges of each tank half, and the second to finish-form the part. The initial drawing operation is followed by a 10 minute anneal at 900°F. The final draw is followed by a 10 minute anneal at 1000°F. Wall thickness of the finished tank is approximately 0.028-inch.

The flash around the edge of each tank half is then trimmed down to approximately ½-inch. In the next opera-

tion a Rheem-designed swaging machine folds this flash inward to form an inward protruding faying surface along which the two tank halves are silver-soldered together.

The tank halves are then mounted in a rigid alignment jig and brought together for initial tacking. After tacking, the tank is removed from the jig, and the two halves are silver-soldered together. A semi-fillet joint is used, and the silver solder flows readily between the faying surfaces of the swaged edges.





*Here partially formed copper capsule halves are being intrim annealed prior to finish forming. Two draw forming operations, with an anneal following each draw, are required.*

The steel girth section of the outer steel tank is formed on a true circle roll and submersion arc welded. The dome-shaped end sections are formed from sheet stock on a double-acting press.

#### **The welding of steel and copper**

The first operation in assembling the tanks together is to slip the sheet steel girth section around the welded copper tank. The dome-shaped lower end of the steel tank is then tack welded in place. This assembly is then jigged in a restraining jacket along with the top section of the steel shell. When the jig is closed, the steel outer tank is held in

place around the copper tank just as it will be when completed.

While still jiggled, the copper tank is filled with water at 150 psi pressure. This serves a double purpose. First, it makes sure that the copper tank is watertight. Secondly, the pressure involved expands the copper tank to fit tightly inside the steel shell. From this point onward throughout finish fabrication, every effort is made to retain metal-to-metal contact between the copper inner tank and its exterior steel shell.

After removal from the jig the assembly is dried over an open flame to make certain that no moisture remains between the walls of the copper and steel

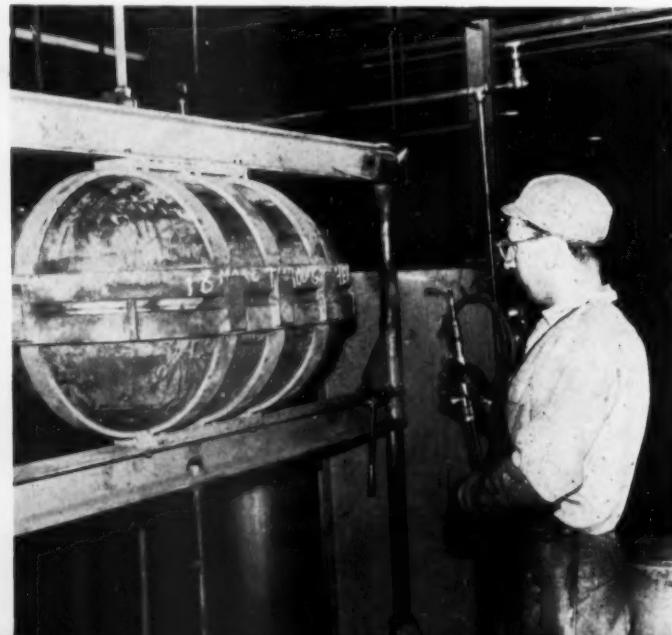
tanks. The assembly is then mounted in an automatic submersion arc welder, and the two end sections of the steel tank are welded to the steel skirt section. The welding heat has no effect on the inner copper tank due to the good heat conducting properties of the copper.

Attachment of the fittings comes next. The fitting holes in the steel shell, pierced during forming, are fitted with special drill bushings so that the fitting orifice can be transferred accurately on through the copper tank. The orifice in the copper tank is drilled slightly smaller than the orifice in the steel shell. A flaring tool is then inserted through the drilled hole in the copper tank. The

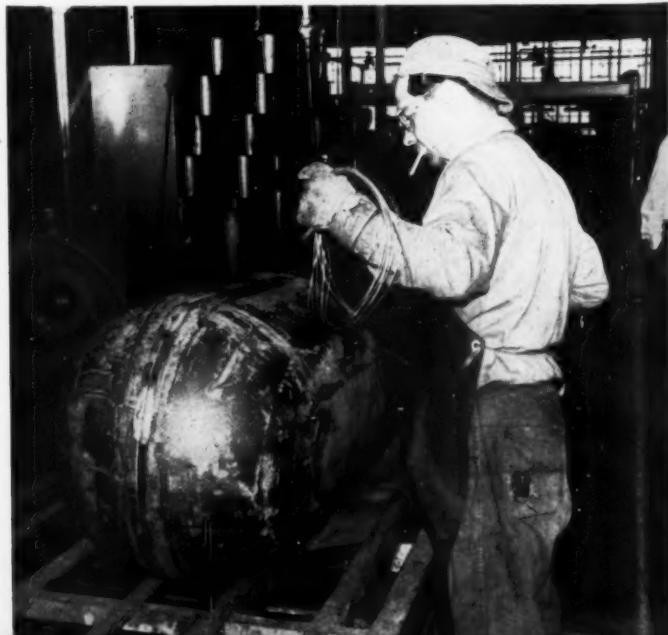


*A completely formed copper tank half beside the press-mounted deep draw die used to form it.*

*Here two copper capsule halves are mated in a jig for tacking prior to soldering.*



*Silver soldering the two copper tank halves together. This is a hand operation. A semi-fillet weld bead is formed, and the silver solder flows well between the inward protruding jaying surfaces.*





Trimming the edge flash on a formed copper capsule half. A flange approximately  $\frac{1}{2}$ -inch wide remains.



This machine folds the copper capsule flange inward so that when two halves are mated and soldered, the faying surfaces will protrude inward.

tool is then expanded and withdrawn, and in this action literally extrudes the copper metal upward and through the orifice in the steel shell to form an effective grommet of pure copper. A ring of silver solder is placed around the fitting beneath its flange before it is inserted through this copper grommet into the tank. This silver solder is subsequently flame-melted to join the copper fitting to the copper orifice grommet. The net result is a fitting installation that provides a pure copper-lined water passage from the inner copper tank to the external water connection.

Final testing comes next. The fitting orifices are plugged, and air at 40 psi

is introduced into the copper tank. Any air leakage from the copper tank will evidence itself through a  $\frac{1}{4}$ -inch tapped hole in the outer steel shell. Next, air is introduced at 20 psi between the copper tank and the steel shell, and the weld seams of the steel shell are soap tested for leakage. The 40 psi air pressure remains in the copper tank during this test to prevent collapse of the copper tank.

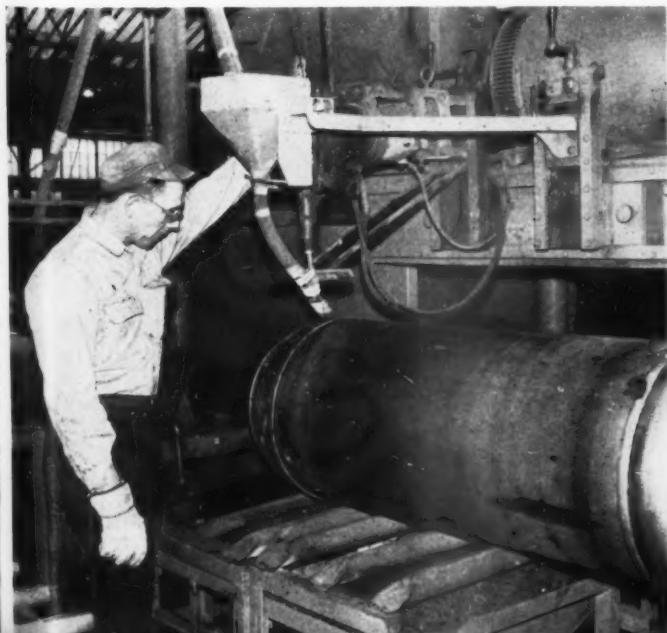
If no air leakage is found in either tank, the copper tank is then filled with water at 300 psi pressure. This provides both an hydrostatic test of overall tank strength and serves again to expand the copper tank tightly within its steel shell.

The  $\frac{1}{4}$ -inch test hole in the steel tank is welded shut while the pressure is still at 300 psi. Thus no air is allowed to enter between the steel shell and the copper tank when the pressure is removed, and what constitutes a vacuum holds the tank walls tightly together even when no internal pressure is involved.

After this final test the exterior of the finished "Coppermatic" tank is cleaned by blasting, then a coating of heat-resistant aluminum paint is applied.

Assembly of the tank unit with its insulation and jacket, pit testing, etc., follows conventional water heater assembly procedures.

Welding the steel tank ends to the steel tank skirt using an automatic submerged arc welder. The copper lining dissipates heat so rapidly that it is not harmed by the welding heat.



Silver soldering tank fittings to the copper grommet formed by extruding copper from the inner tank section.



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MILL  
helps  
RHEEM  
*Deliver  
Safely***



Many leading appliance manufacturers depend upon Chicago Mill and Lumber Company to provide safe shipment for their finished products. They know that experienced engineers and crate designers have used the latest engineering principles and testing equipment to design the best container for their product. They know that they can count on a Chicago Mill container to deliver their valuable finished products safely.

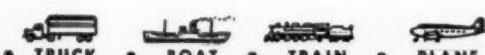
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# RHEEM

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1. Rheemglas Heater and  
Rheem Wedgewood Dryer



2. Rheem Built-in Range.



3. Year 'Round Air Conditioner.



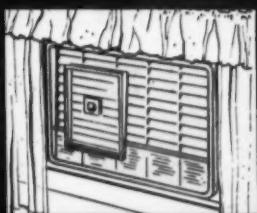
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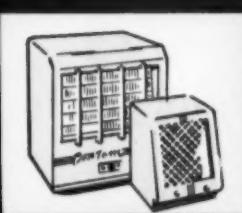
for AIR CONDITIONERS

**Porcelain Enamel**  
is Durable and Thermal  
Shock Resistant.



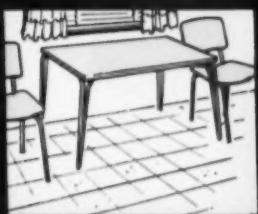
for OUTDOOR SIGNS

**Porcelain Enamel**  
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Weatherproof.



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**Porcelain Enamel**  
is Heat Resistant.



for METAL FURNITURE

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for attractive finishes!

**TITANIUM FRITS**  
for high opacity white cover coats!

**MILL ADDED COLORS**  
for color cover coats that match from batch to batch!

# Want with *Frits by PEMCO*

Acid  
Resistant

Weather  
Resistant

Alkali  
Resistant

Abraslon  
Resistant

## Whatever qualities you require, there's a Pemco Frit engineered for your product

Whether it's the gray ground coat on bare metal or a white or colored cover coat, Pemco porcelain enamel frits are tailored to eliminate production problems and sell your product. Whether you make refrigerators, washers, dryers or ranges, a quality finish can be produced at less cost *only* by using uniformly high quality frit. That's why Pemco has developed its manufacturing process around . . . .

**Control** — Temperature and other factors in the continuous smelting processes are automatically controlled . . . eliminating contamination or variation in the frit.



**High Standards** — Constant checking on every phase of the process, from the mixing of ingredients to bagging the frit, assures consistently good performance of Pemco products.

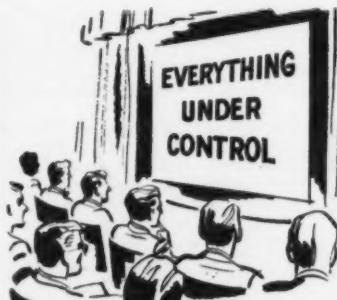


**Research** — Testing the final qualities of the finish against customer specifications, and searching for new and better ways to help the customer obtain a finer finish is the constant job of Pemco engineers.



These are only a few ways Pemco works toward giving you better products at less cost. For more information on the role Pemco frits can play in your plant and help in your enameling problems, contact the Pemco Representative in your territory.

See the new color-sound movie illustrating the many ways in which quality control enters into the manufacture of frits, colors, stains and other materials used in ceramic products.  
AVAILABLE TO YOU AT NO COST!



**PEMCO corporation**

BALTIMORE 24, MARYLAND

Manufacturers of "The World's Finest" Porcelain Enamel Frits, Coloring Oxides, Screening Pastes, Glaze Frits, Body and Glaze Stains, Underglaze and Overglaze Colors, Vitrifiable Glass Colors.

### PEMCO CORPORATION

Baltimore 24, Maryland

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Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# SPEE-FLO



# News Letter

Published by THE SPEE-FLO CORPORATION, 720 Polk Ave., Houston, Texas

## Rheem Plant in Houston Uses Spee-Flo Hot Spray Heaters For All Finishing and Drum Litho Operations

### PAINT REJECTS CUT IN RHEEM WATER HEATER LINE.

Because of Rheem's rigid inspection system, the reject ratio in the paint department was a problem until Spee-Flo Heaters were introduced two years ago.

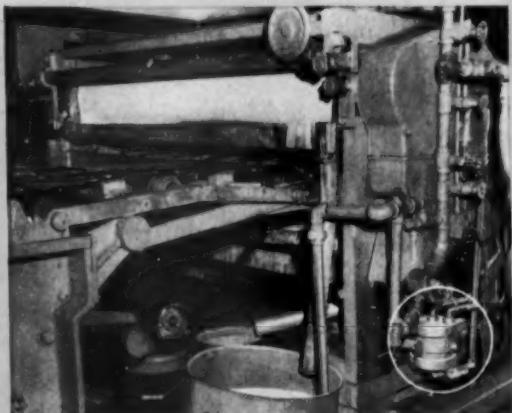
Paint department rejects previously ran high, frequently under changing temperature and humidity conditions. When Spee-Flo Hot Spray units were installed on the water heater line, rejects were cut to less than 3%, according to Rheem-Houston.

Rheem's paint production line, using their standard baking enamel with the hot spray heaters, now produces a more uniform finish in fewer spraying passes. This means more units per hour. The hot spray finish has better holdout with fewer runs and sags. Orange peel, a former bugaboo, has practically been eliminated. Reduced overspray because of lowered atomizing pressure contributed to material savings. In effect, Rheem got better quality control at lower cost.

**SIMPLE AND TROUBLE-FREE.**  
The unique coilless design of the Spee-Flo Heaters has probably contributed to the growing trade acceptance of the hot spray process. Rheem's Houston plant reports a total maintenance cost of less than \$5 per year on their hot spray heaters.

Rheem has recently converted to the electrostatic process on their water heater line. Here, too, the Spee-Flo Heater is installed to assure constant viscosity control and uniformly metered flow. This installation employs the Model 300 A in combination with a precision Viscotroller attachment.

*Paint heater helps produce perfect litho on steel.*



The famous Rheemcoat lithograph process got a boost in production efficiency with the installation of the Spee-Flo Viscotroller illustrated, left. A giant litho press prints the advertising message on steel plates which go into the manufacture of Rheem drum products. As in any printing press, viscosity control is critical. Daily and seasonal temperature changes formerly caused viscosity variation and consequent relatively high reject ratio. Following installation of the Spee-Flo Heater, production department figures showed rejects down to three-tenths of 1% . . . a nearly perfect record. Production management claims that the Spee-Flo Heater paid for itself the first week! The heater has required no maintenance since its installation.



**QUESTION:**  
How does hot spray produce material savings?

**ANSWER:**  
Material savings—that is, the use of less paint for equivalent film thickness—can be produced with hot spray because viscosity is reduced and, therefore, less atomizing pressure is required. Lower atomizing pressure means less bounce-back and less overspray. Overspray reduction may then be converted into material savings, or greater film thickness, if desirable.

**QUESTION:**  
What atomizing pressure should be selected?

**ANSWER:**  
The well-known rule "The best pressure is the lowest pressure" applies only on the assumption that good atomization is not being sacrificed. Therefore, the best atomizing pressure is usually the lowest pressure at which good breakup (atomization) of the material is maintained.

**ADVICE:**  
Thinner is the cheapest item in the plant. Don't sacrifice good atomization by cutting back thinner too much. Use it with heat to produce LOW viscosity, and the fast solvent evaporation at the gun will still produce the high solids film deposit.

**QUESTION:**  
Does hot spray always produce material savings?

**ANSWER:**  
No. If the heat is simply used to replace thinner, and viscosity is not reduced below cold spray viscosity, then lowered atomizing pressures cannot be employed—thus, no material savings. Quality control, of course, can still be expected.

**QUESTION:**  
What reduction should be used for conventional paint materials that are hot sprayed?

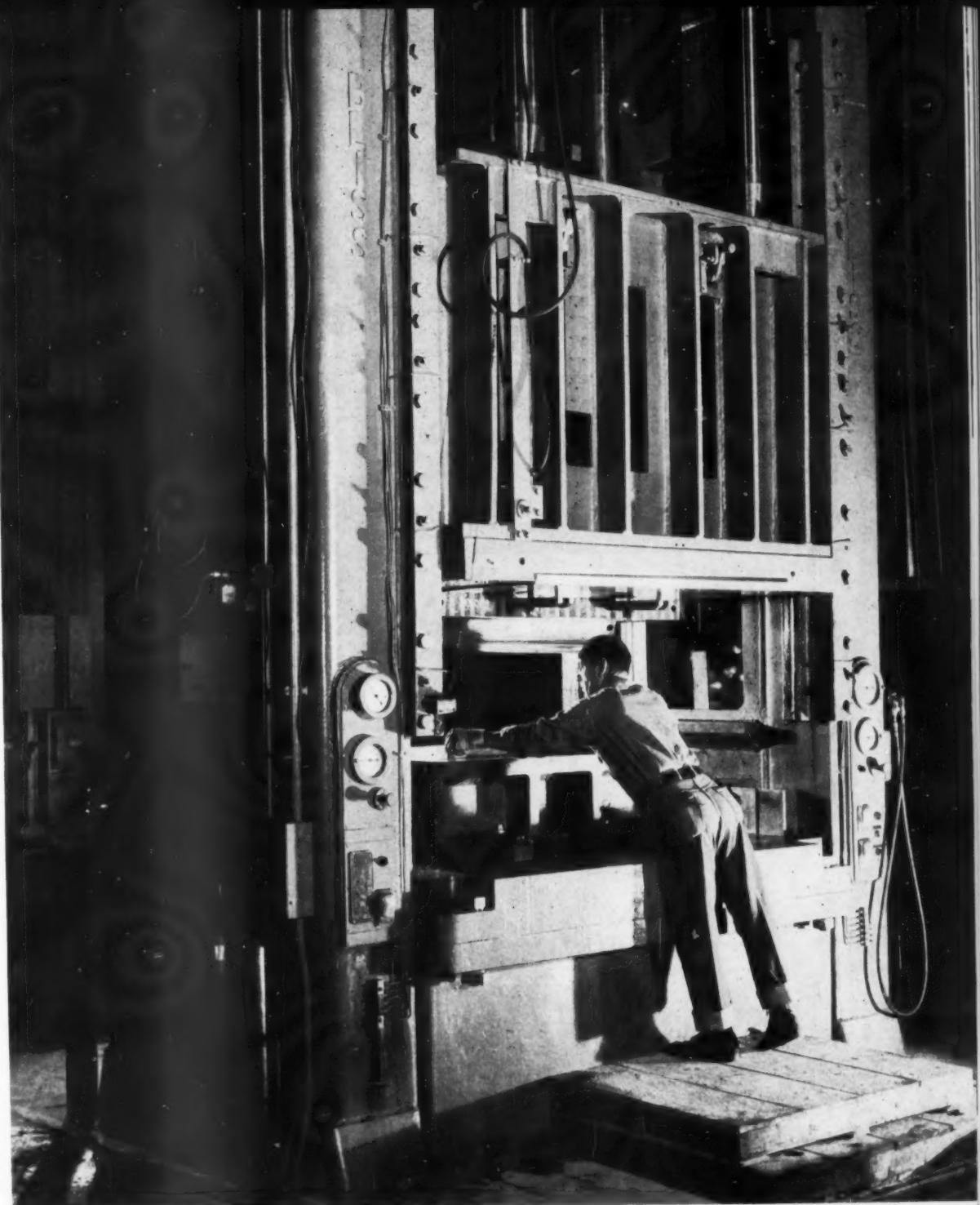
**ANSWER:**  
From 50% to 60% of cold spray reduction. This reduction will assure adequate flow-out, minimize or eliminate orange peel, and still reduce viscosity sufficiently low enough to take advantage of lowered atomizing pressures. If a conventional material is of "ready-to-spray" viscosity, it may still be hot sprayed to full advantage except that solvent evaporation will be greater.

### FREE BOOKLET



Get the facts about this important development—presented in an informative and straightforward way. Write the Spee-Flo Corporation, 720 Polk Avenue, Houston, Texas.

*View of a heavy press at the Government Products Division at Downey, California.*



## **Rheem produces a wide variety of important government products**

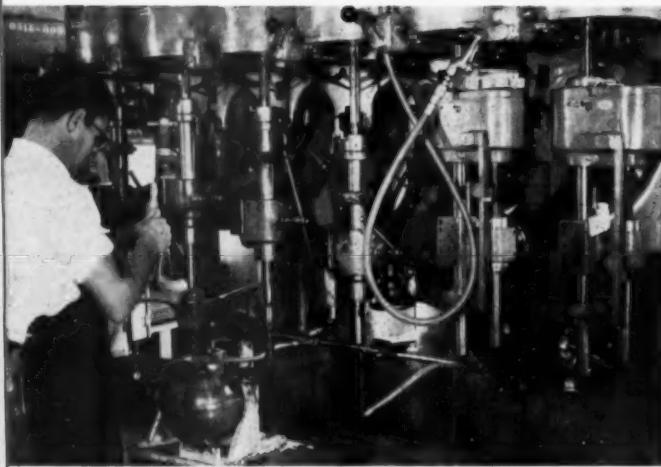
a photo story of representative projects appears on the following pages →



Left: Rheem uses porcupine units, developed by the company, to drill holes in missile skin, shown stacked in foreground. The porcupine is actually a General riveter machine with air-operated hydraulic cylinder. It features adjustable spacing in a two-phase operation. In the first phase the unit can drill up to 48 holes and as many as 25 holes in the second phase. Two years ago this work was a hand operation—one hole at a time.

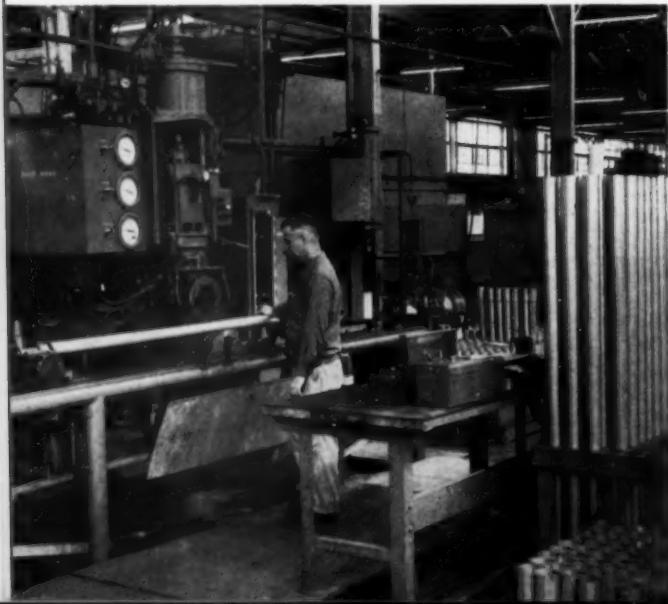


Operator begins counterboring, machining operation on aft body section of Nike missile. Other sections are stacked at right and in the background.



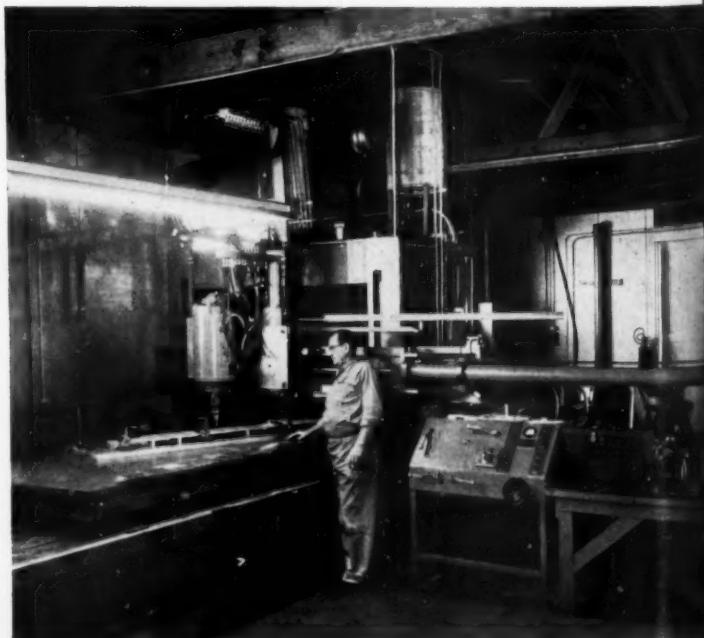
Multiple spindle drills—in a bank of six drills—are used to drill missile fuel booster tanks.

This is the electrical seam welding operation on F-89 rocket tubes, units of which are shown stacked at right and in the foreground.



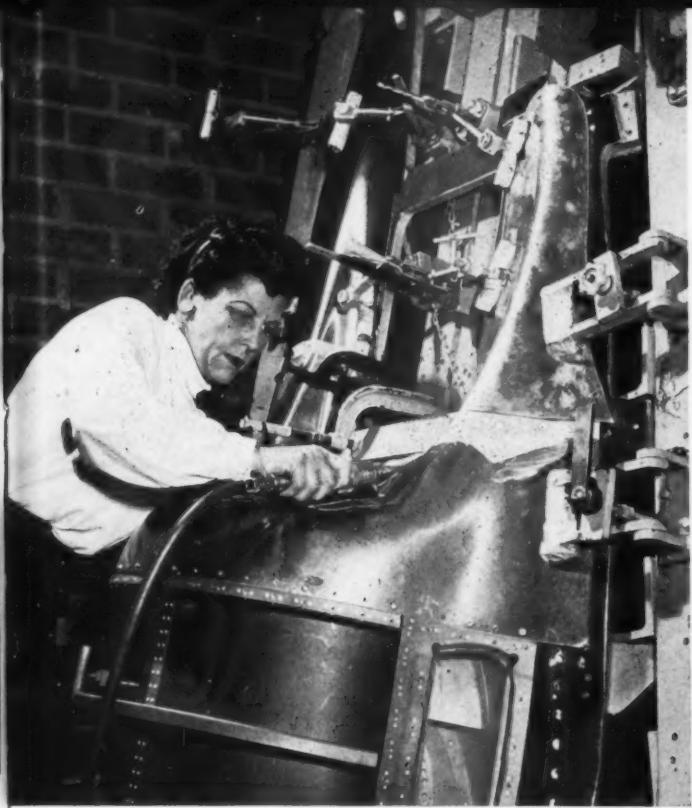
The Rheem Government Products Division . . . is a major division of Rheem Manufacturing Company. In fulfilling contracts for government products, Rheem provides facilities and resources of a large organization. Operating through a "project" approach, the Company offers the flexibility required by the range of the programs it carries out.

Rheem Government Products' activities fall into six principal categories. Systems include warheads, missiles



This large skin mill machines aircraft skins and ribs, handling parts as big as 66 inches wide and 30 feet long. The Downey aviation plant also operates a larger skin mill accommodating parts up to 72 inches wide and 27 feet long.

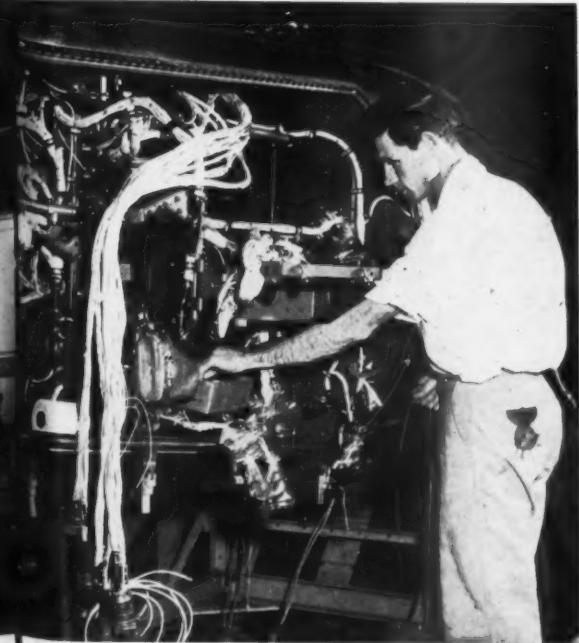
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Woman worker riveting sub-assembly of T-33 scoop.

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and drones, electronics and simulators. *Airframes* include variety of components for aircraft, missiles and sounding rockets. *Propulsion* covers the work done on jet engine components. *Ordnance* works on ammunition products and components as well as armament items. *Packaging* is done on engines and missiles as well as various liquids and solids. *General* is the term used to include work on quality control, testing and research and development.

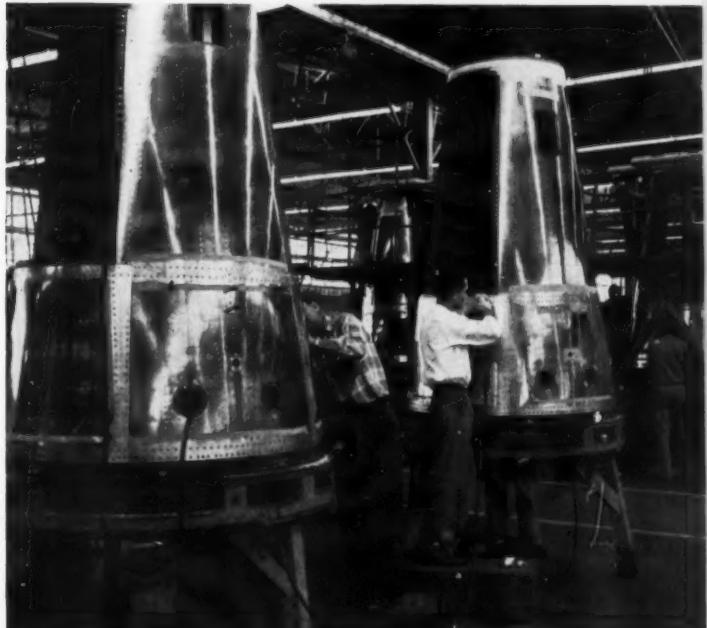


F-89 radar rack electrical installation.

dling  
wney  
lating



Finishing operation on T-33 scoop.



Assembly line operations on F-89 fuel nose.

Vertical turret lathes mill rings for jet engine project.



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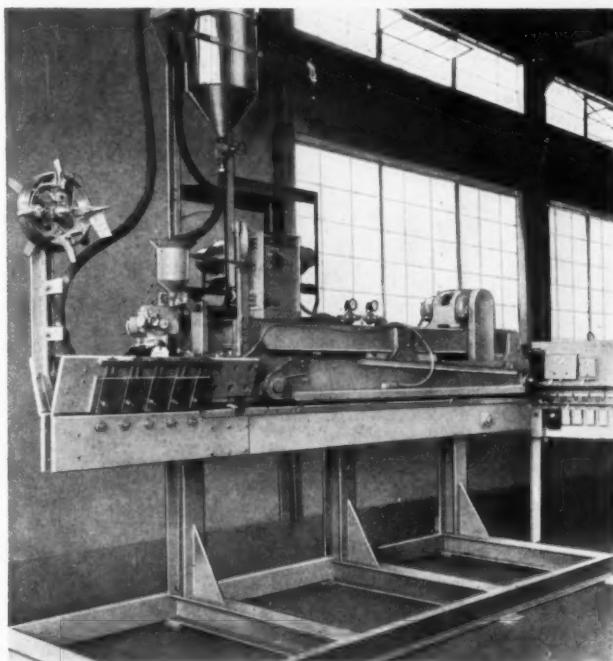
Seattle 8, Wash.  
105 Orcas Avenue  
MOhawk 2030

# DEPENDABILITY—SPEED

CARANDO BUILT MACHINES give to Rheem Manufacturing Company the dependability and speed on their production lines that is so necessary to maintain their position as a leader in the water heater and the steel barrel industry.

CARANDO designs and builds a complete line of machinery, dies, and equipment for the water heater, steel barrel, and steel pail industry.

For increased production and lower costs it is wise to see what CARANDO EQUIPMENT can do for you.



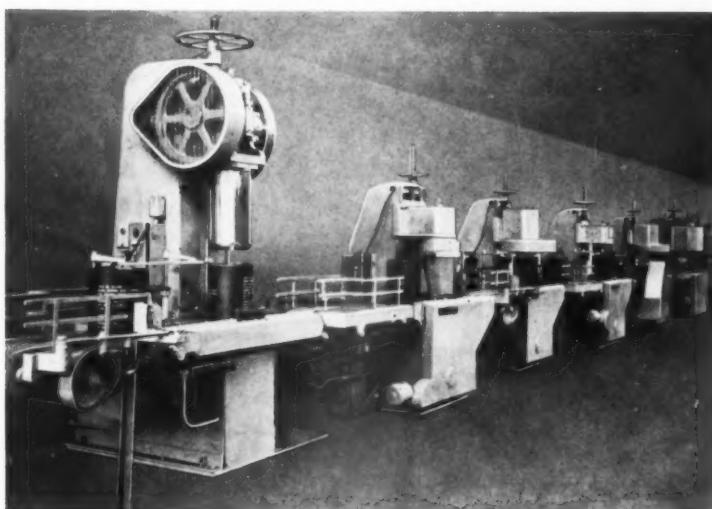
CONTINUOUS BOILER SHELL WELDER

## FOR THE WATER HEATER INDUSTRY

TRUE CIRCLE BODY ROLLS  
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MULTI-SPINDLE TAPPERS  
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DOUBLE SEAMERS  
FLANGERS  
SWEDGERS  
NECK IN AND FLANGE  
CURL AND SWEDGE  
TURNOVER DEVICES  
SHEET FEEDERS  
SHEET STACKERS  
SHEET EDGE GRINDERS  
SHEET SLITTERS  
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HIGH SPEED PAIL LINE — RATED PRODUCTION  
2000 — 5 GALLON PAILS PER HOUR

**CARANDO MACHINE WORKS**  
420 N. MADISON ST. • STOCKTON • CALIFORNIA



Specialists in Metal-Cleaning Products



Samuel H. Davis, general foreman, checks finish on bumpers.

## Rheem Automotive Company cuts production costs with Wyandotte B.N.

The Rheem Automotive Company, of Vernon, California, is a leading manufacturer of automotive springs and bumpers. Its new plant, now under construction at Fullerton, California, will house the largest plating installation on the West Coast.

Because of its high manufacturing standards, Rheem insists upon high quality from all its suppliers. In the manufacture of automobile bumpers, where a gleaming finish is so important, great care must be exercised in the metal-cleaning operations. Wyandotte B.N. helps make this job easier and more economical.

Wyandotte B.N. is a versatile

cleaner that does many jobs well. Rheem Automotive Company uses it as a soak cleaner, and as both an anodic and cathodic electro-cleaner. They report excellent cleaning results. Wyandotte B.N. helps them keep cleaning costs low, too, because it has an exceptionally long cleaning life. And, with Wyandotte B.N., rejects are cut to a minimum!

In addition to Wyandotte B.N., Rheem Automotive Company uses three other Wyandotte metal cleaners: Industrial No. 38, P-1075, and MK.

Wyandotte's complete line of industrial cleaning products can help you improve the quality of your

finishes. Your Wyandotte representative can show you how to get top efficiency and lower use-cost in *all* of your industrial cleaning operations. Give him a call today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

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CHEMICALS

J. B. FORD DIVISION



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CBQ takes great pride in  
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to supply fittings for Water  
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For many years,  
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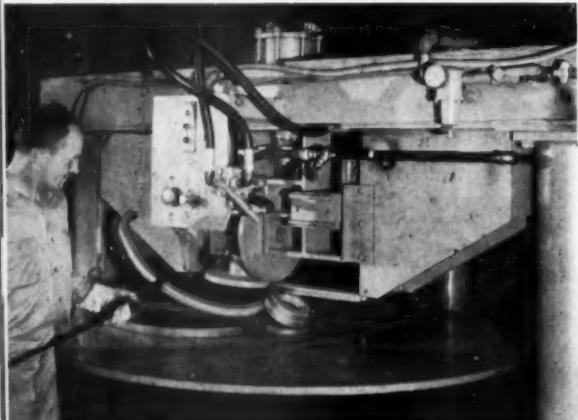


CHAMBERS, BERING, QUINLAN CO.

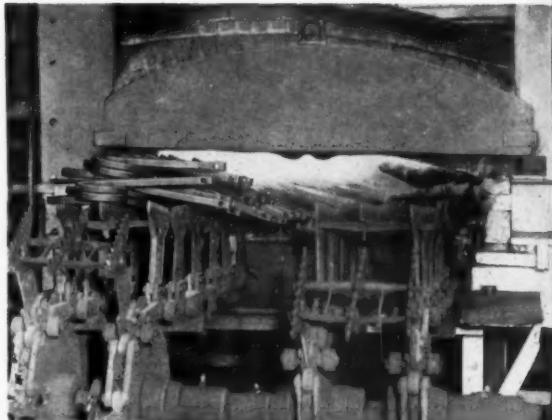
700 NORTH JASPER ST.

DECATUR, ILLINOIS

## Rheem Automotive Company serves the farmer and the auto builder



*Left: Shown here is a coiling machine for forming coil shanks. Especially designed to exact specifications, it guarantees a perfectly-formed coil.*



*Right: Rheem-Silver Line coil shanks being heat-treated for toughness and elasticity.*

### AGRICULTURAL PRODUCTS



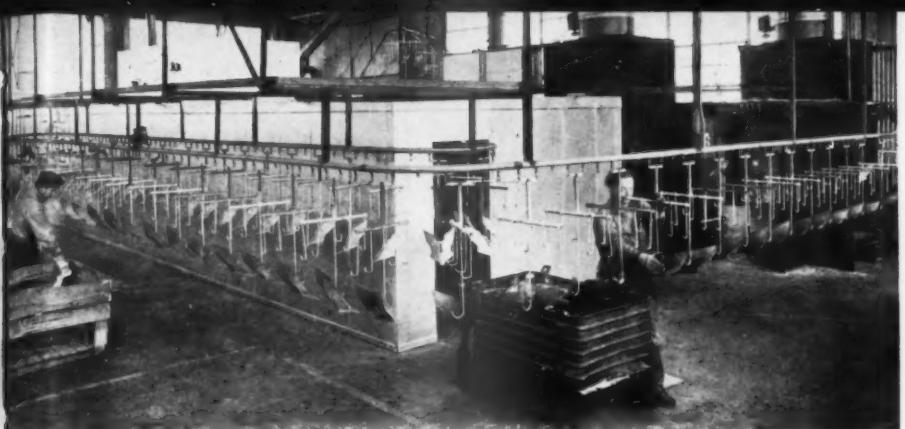
*Left: Huge drop hammers form or edge spring-steel farm tools. After these operations, parts are heat-treated to achieve the final toughness.*



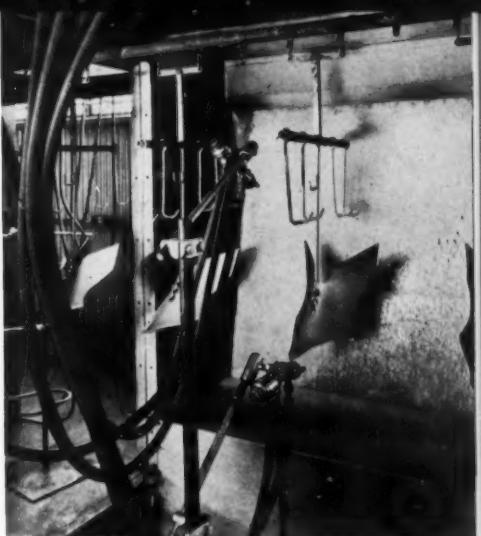
*Right: A Cultivator Steel is being tested for hardness. Regular spot checking of these parts and 100% inspection of many others are a part of quality control.*

*Architect's drawing of the new factory and office building for the Rheem Automotive Co. at Fullerton, California. Automotive and agricultural products will be manufactured in this new plant upon completion (approximately July, 1956).*





Right: This spray booth shows furrowers being sprayed from fixed automatic spray nozzles. Above: This is a general view of the Rheem Automotive Company's farm tool paint line, conveyorized for spray and dip. Furrowers are shown going through the line. Spray booths are at right, oven at center.



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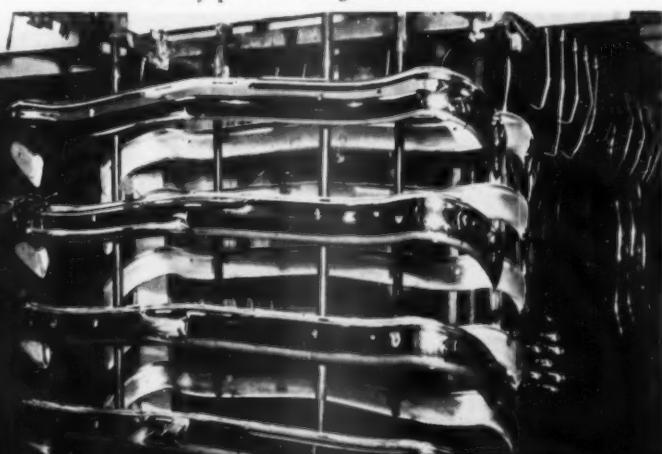
#### AUTOMOTIVE PRODUCTS

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Visual inspection is given each panel for automobile bumpers as it travels down the conveyor from the fine finish polish and cleaning. Spots not up to perfection are repolished. Panels with defects that cannot be corrected are removed and stacked for salvage committee to determine cause and responsibility. These photos are typical of the quality control routine practiced by the company.

Right: One panel each half hour is checked for surface smoothness with Profilometer. A finish of 5 to 10 micro-inch tolerance is maintained. Correction in belt tension is made to bring the surface smoothness between these two limits. Below: These Rheem bumpers have just passed through the chrome buff and are being conveyed to shipping platform. The inspector is making a visual check to note any possible irregularities.

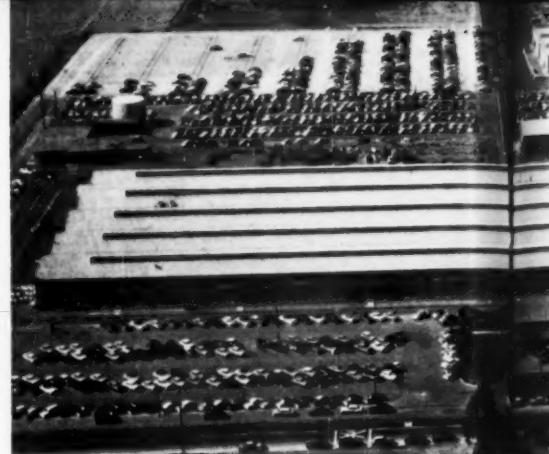




RHEEM



LINDEN



SPARROWS POINT

RICHMOND



## Manufacturing . . .

photographs of

### Domestic plants and products

#### **Richmond, California**

Steel drums, pails, fibre drums, boilers and tanks

#### **San Pablo, California**

Ordnance components

#### **Newark, California**

Gas ranges, gas furnaces

#### **South Gate, California**

Steel drums, pails, water heaters, tanks, boilers, water softeners, fibre drums, equipment containers

#### **Downey, California**

Aircraft components, missile components, jet engine parts

#### **Downey (Research and Development)**

Electronic devices, research and development on government products

#### **Houston, Texas**

Steel drums, water heaters, boilers, tanks, evaporative coolers

#### **Chicago, Illinois**

Steel drums, pails, water heaters, boilers, tanks, furnaces, air conditioners, fibre drums, equipment containers and clothes dryers

#### **Linden, New Jersey**

Steel drums, fibre drums

#### **Sparrows Point, Maryland**

Steel drums, pails, boilers, tanks, water heaters

#### **New Orleans, Louisiana**

Steel drums, pails, tanks, ordnance components

#### **Seattle, Washington**

Water heaters

#### **Philadelphia, Pennsylvania**

Research and development; gunnery trainer - simulation

#### **Rheem Automotive Company, Los Angeles, Calif.**

Automotive springs and bumpers, farm tools, highway guard rails

#### **Burlington, New Jersey**

Ordnance components



DOWNEY



SOUTH GATE

## ... facilities

typical plants

### Affiliated and associated foreign companies

Rheem-Australia Pty. Limited  
Sydney, Brisbane, Melbourne,  
Fremantle, Adelaide

Rheem Metalurgica, S. A.  
Rio de Janeiro

Rheem Canada Limited  
Hamilton, Ontario

Rheem-Hume (Far East) Limited  
Singapore

S. A. Industrial & Comercial  
Aceros Rheem  
Buenos Aires

Rheem Peruana, S. A.  
Lima, Peru

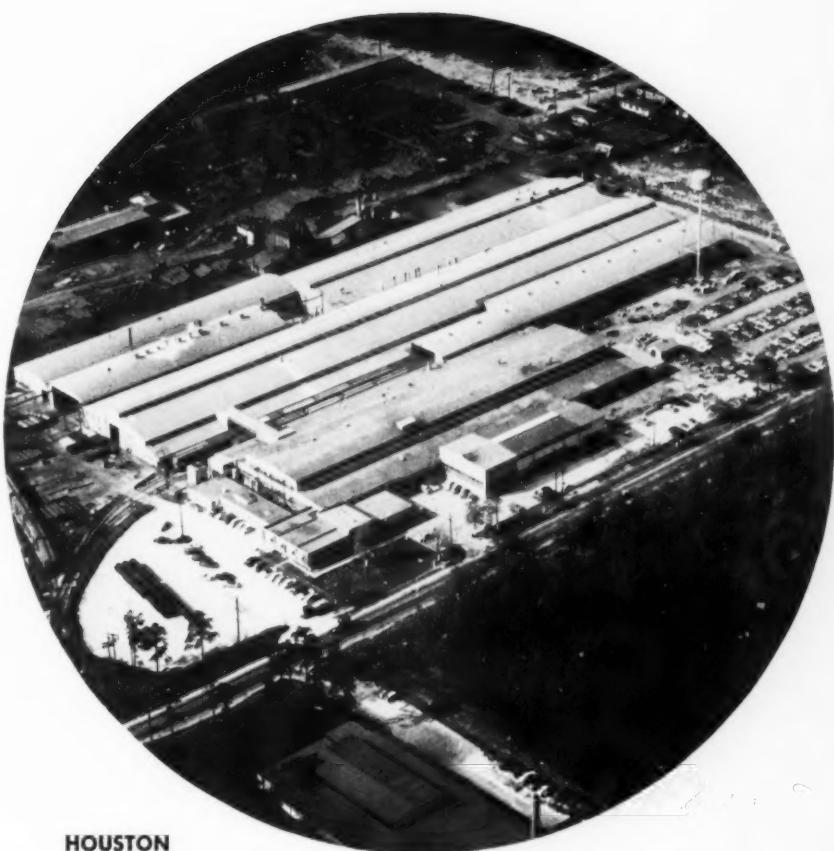
Rheem Lysaght Limited  
Bristol, England

Rheem of the Philippines, Inc.  
Manila

Rheem Elit Emballage  
Dals Langed, Sweden

Societa Per Azioni Fusti E  
Imballaggi Metallici  
Milan, Italy

Fabricacion De Envases Metalicos, S. A.  
Madrid, Spain

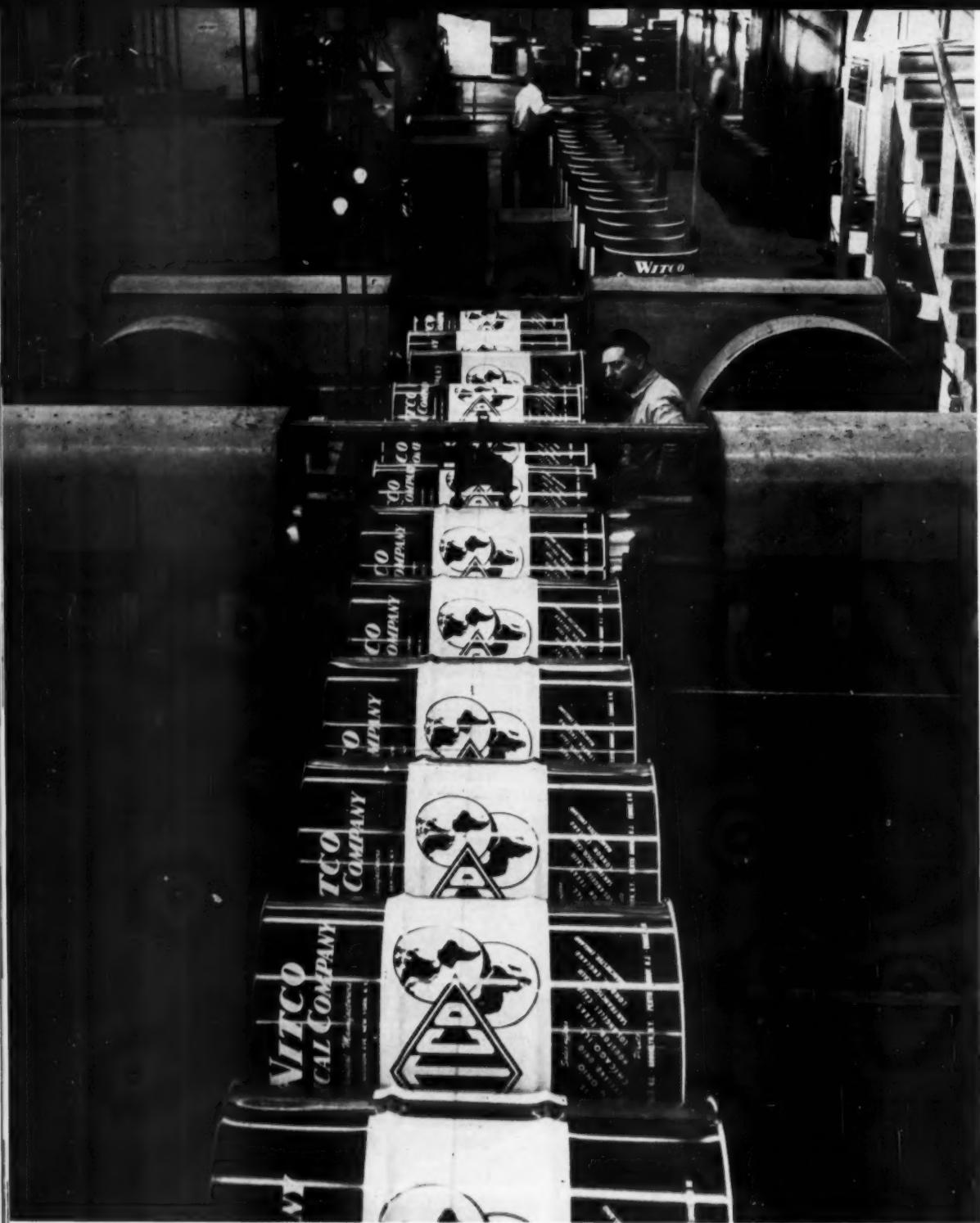


HOUSTON

CHICAGO



SHOWN on these pages are 7 of the 15 domestic plants of Rheem Manufacturing Company. These plants contain an area of 4,612,592 sq. ft. and employ 9,000 persons. The kwh used annually is 128,726,400. 419 presses under 100 tons are used; presses over 100 tons total 218. Gas used annually amounts to 3,335,820,000 cu. ft.



This photograph shows swaging operation on the steel drum line at South Gate, California.

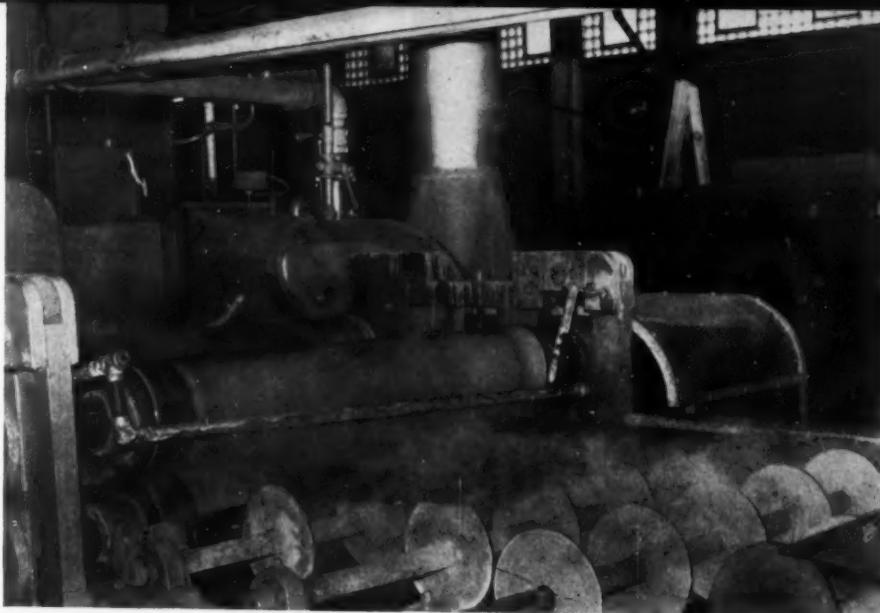
## Ultra-modern production lines for steel drums and pails

finishphotos

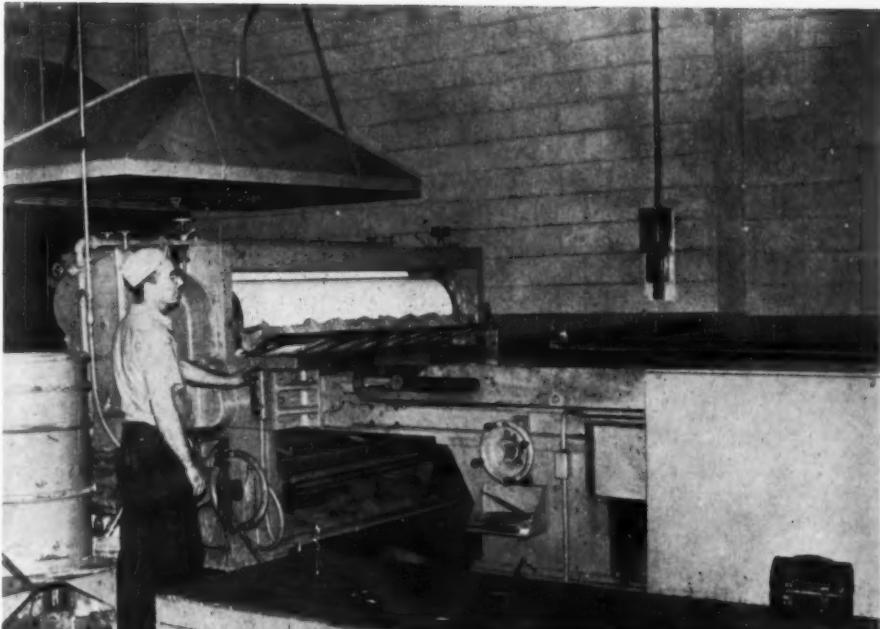
A detailed, illustrated production article will appear in a later issue of finish.

**M**ODIFIED automation . . . teams up with experienced production men to finish and fabricate 600 lithographed units per hour on a continuous line at Chicago for producing 55-gallon steel drums.

*Steel is washed, rinsed and given phosphatizing coating after thorough blast cleaning.*

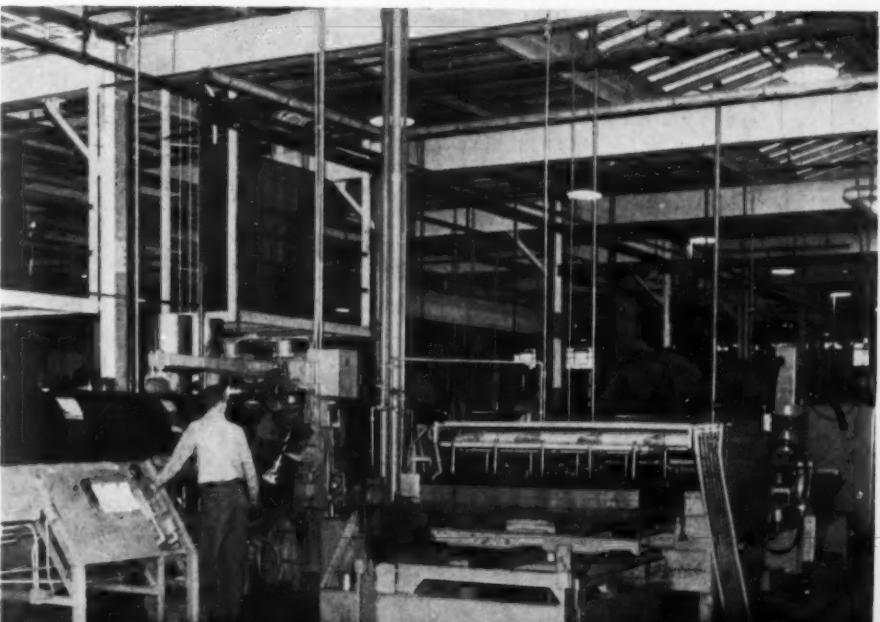


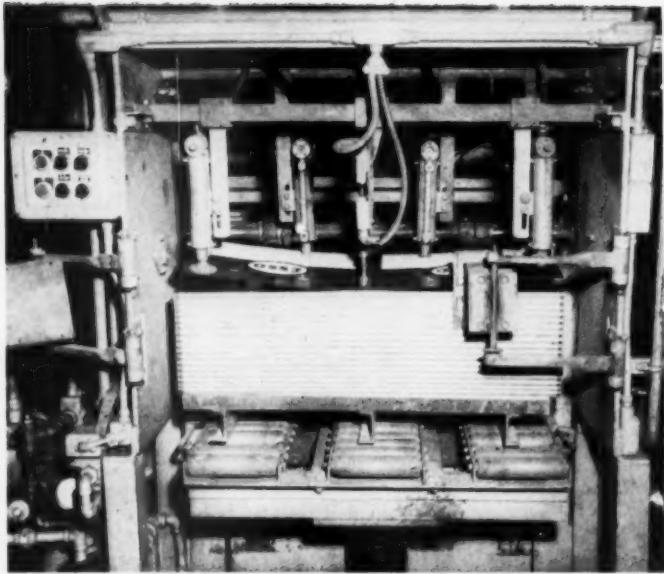
*Steel drum stock is given specified lining by roller coating on special Rheem-developed equipment.*



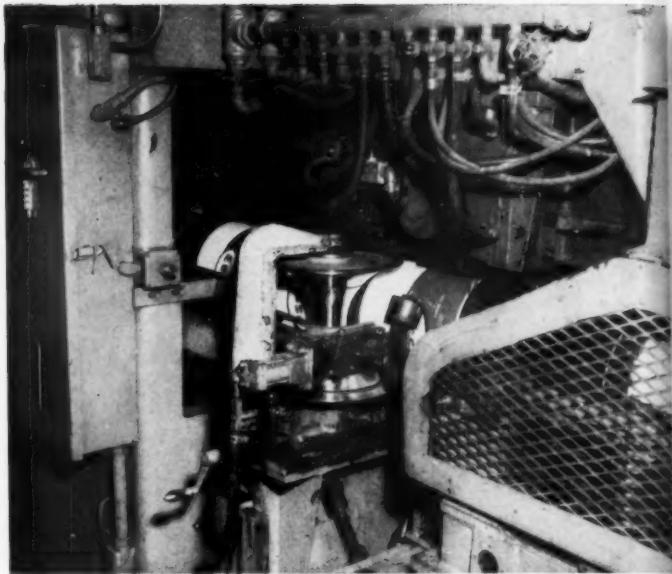
*Photograph showing relative position of feed for steel sheets into line fabricating 55-gallon steel drums.*

**Record production . . .** of steel pails set a new company record of 18,053 pails for a single day on Friday, July 15, 1955. A series of photographs showing highlights of the New Orleans production line appear on the following page.

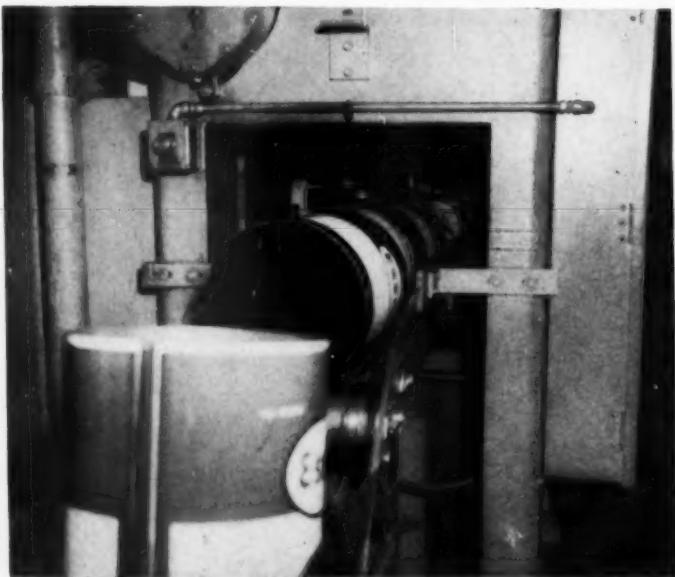




Lithographed steel sheets feed into pail line.



Side seams of pails roll welded at high speed.



Up-ending on delivery from welding of side seam.

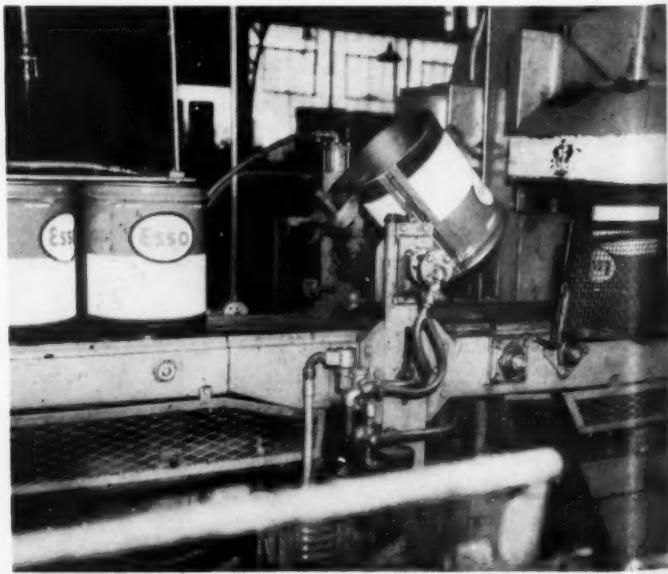


Expanding mandrell gives true cylinder form.

Swage is added near top in this operation.



Turn-over for first step of double seaming bottoms.





# Wire Forms AND FLAT SPRINGS

**Precisely What You Want  
Promptly When You Want Them**

Our congratulations to RHEEM, a recognized leader in the field of steel shipping containers, for a job well done.

We at Pittsburgh Wire Form are proud to be a supplier to this outstanding organization.

To us, an intricate design is a welcome challenge. Send us your drawings or necessary data. We may be able to help you speed production and cut costs. Large or small order, we'll give you precisely what you want, when you want it.

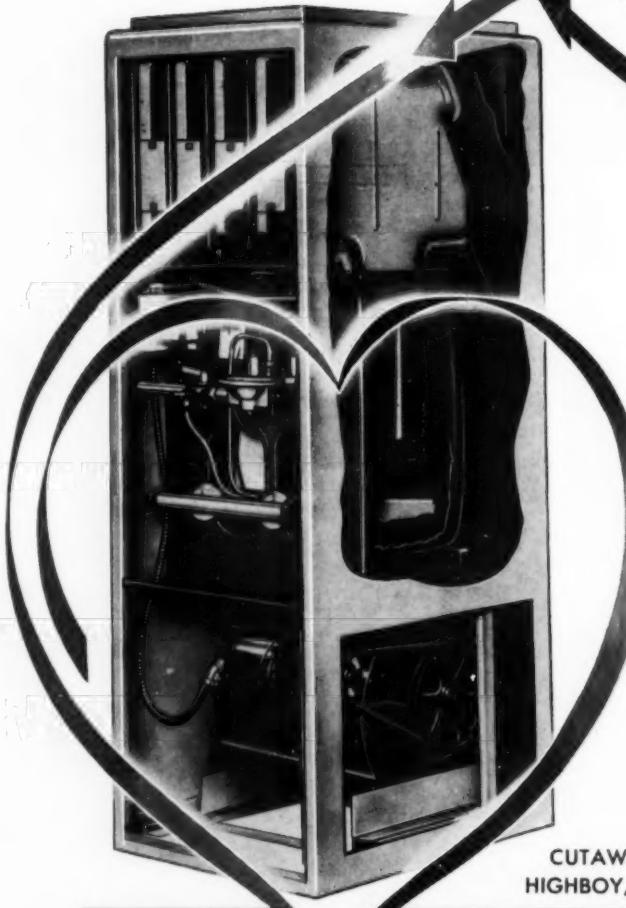


**PITTSBURGH WIRE FORM & MFG. CO.**

49th Street and AVRR Pittsburgh 1, Pa. MUseum 1-7812

**Even distribution**

*the heart of  
your heating  
comfort*



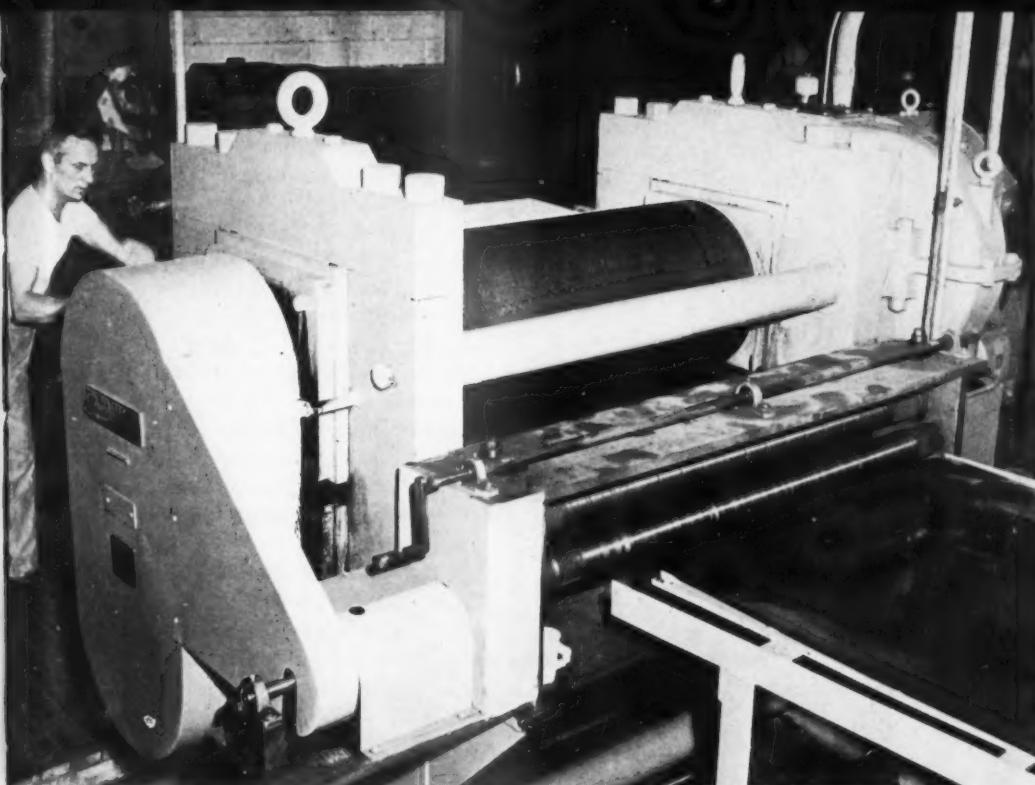
CUTAWAY VIEW OF RHEEM IMPERIAL  
HIGHBOY, SHOWING MORRISON BLOWER

For many years it has been the privilege of Morrison to work with Rheem Manufacturing Co. in developing a blower assembly equal in quality to the high standards set by the Rheem furnaces.

The result is a dependably even distribution of air — the "heart" of any Heating System.

Write Morrison for blower parts to meet your requirements.

**MORRISON PRODUCTS INC.** 16816 WATERLOO RD.  
CLEVELAND 10, OHIO



*Embossing machine used for "rigidizing" the hot rolled steel sheets used in the production of warm air furnaces for home heating.*

*finishfoto*

## **Heating, drying and air conditioning**

**in its Chicago plant Rheem builds a complete line of central heating equipment for the home, winter and summer air conditioning equipment and home laundry dryers**



A complete line of home heating equipment manufactured in the Rheem Chicago plant includes Highboys, Lowboys and counterflow units. Two lines are manufactured, standard builder's models and deluxe Imperial models.

In discussing the engineering features with members of the development engineering staff some of the features of the 1956 line were covered. For example, the heat exchanger assembly has been given first attention by the design men. It is of all-welded construction, and the design promotes maximum rigidity and prevents "oil canning". All components are die fabricated.

Burners have been designed to pro-

duce a controlled flame pattern which fits the contour of the combustion chamber. Gas burners were designed for ease of cleaning, with all parts either drilled or slotted.

Burners for the oil furnaces are mounted with special resilient mounts to minimize sound transfer. Easy access for cleaning was given consideration in the design of both gas and oil fired units.

All home heating plants for 1956 are designed to accommodate summer air conditioning equipment. It was pointed out in this connection that while there may be a 600° difference between heat exchanger and room temperatures for home heating, that there may be a difference of only about 30° between evaporator and room temperatures for summer air conditioning. This factor

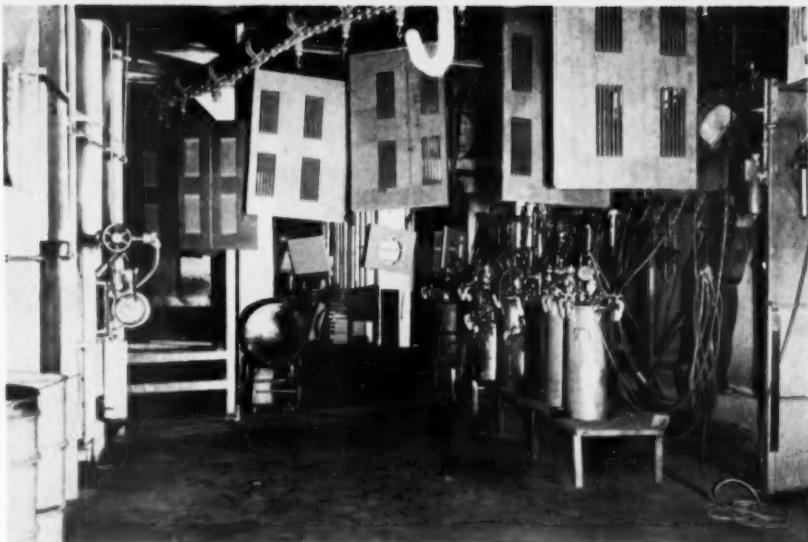
alone greatly increases the air movement requirements.

The winter air conditioners for 1956 are designed to receive a special plenum cabinet which can be installed to receive a summer air conditioning circuit. This adds cooling and dehumidifying to the original system which provides heating, filtering, circulation and ventilation.

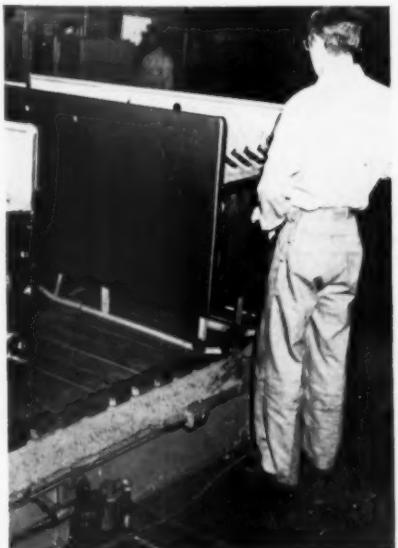
Rheem also produces a blower-evaporator package for addition to any standard heating plant.

### **"Rigidized" steel for cabinets**

All steel sheets for the exterior cabinets of heating and air conditioning units are passed through an embossing machine for adding a texture to the surface. This "rigidizing" process produces a permanently embossed texture, replacing the surface effect normally ob-



*Section of the organic finishing line, showing furnace parts, on the conveyor chain. Flow coating equipment is at left, water wash spray booth at right and baking oven in background.*



*Left: Section of the primary assembly line, showing installation of the heat exchanger in the furnace cabinet while in a horizontal position. Right: First pit in the final assembly line shows availability of components such as burners, controls, etc., to workers.*



*Final operation test ("flame-testing") at the end of the assembly line. Gas hose with quick coupling and snap-on electrical connections feed from test pit.*

*finishfotos*

tained through the application of special surface finishes. Reasons for the embossing are the resulting increased structural strength, damping vibration for quiet operation, and enhanced appearance.

Sides, back and some interior braces and components are assembled following fabrication in the press shop before cleaning and finishing. These jackets move through a 5 stage cleaning and phosphatizing machine. Stages 1 and 2 — clean and phosphatize at 180°F; stage 3 — rinse at 160°F; stages 4 and 5 — chromic acid at 160°F followed by a 15 ft. dry off.

Final finish is sprayed in a water wash spray booth and consists of an aluminum baking finish giving a final effect of a soft gray. On some models color is added to both interior and exterior by using contrasting colors for exterior door panels and for blower units or combustion units inside.

Finish baking is accomplished in a U-shaped convection oven with 160 ft. conveyor travel at a temperature of 300°F.

#### **The heat exchanger**

Fabricated from hot rolled steel, first operation on the combustion chamber section is to pierce 3 openings as flue outlets followed by the addition of 3 embosses to the opposite panel for strength. The shape is then formed on a special form die in an hydraulic press. Flanged ends ( $\frac{7}{8}$ " flange) are then spot welded to the formed chamber body. The chamber is then seam welded at all accessible points, and these few remaining points are hand arc welded to complete the all-welded chamber.

Panels for the radiator sections are blanked, formed and pierced in the press department and then transported to the welding department where the first operation is the spot welding of 3 baffle plates to each radiator half. When the two "halves" are seam welded together, these baffles form channels for heat flow. Hand arc welding also supplements seam welding on these radiator sections.

Depending upon the model, from 2 to 8 radiator sections are welded into a single unit by placing the combustion chamber top across these sections in a revolving jig and arc welding. All heat openings are then hand arc welded to the combustion chamber top.

The radiator assembly is then placed

in a fixture with the combustion chamber and are welded into a single unit heat exchanger.

Following cleaning, phosphatizing and drying, a black graphite base baking undercoat is applied and baked for 18 minutes at 300°F.

#### Assembly and testing

Both exterior cabinets and heat exchanger units are delivered by conveyor to a primary assembly line. Here aluminum foil backed insulation is cut to fit the interior panels and installed, followed by the installation of the heat exchanger. These operations are performed with the unit in a horizontal position on the conveyor.

A paper cap is then placed over the cabinet top and the sub-assembled unit partially crated. Bottom, top, back and sides of crate are completed and the unit placed upright on the belt of the final assembly and inspection line.

Components are then installed: blower unit (including squirrel cage blower, motor and belt drive mechanism); fan and heat limit switches; safety switch (gas shutoff); transformer; burner unit (including pilot to B valve, thermocouple to control and tube to pressure regulator); manifold (A valve, B valve, pressure regulator and magnetic valve); and disposable air filter.

The heater as first crated has waxed corrugated protectors for corners and center braces, and one steel strap is in place. Next step on the assembly line is to connect the electricity and gas and run an operating test for burners and controls. The front of the crate is then added to ok'd heaters, and two additional steel straps added and the crate closed for shipment.

#### Laundry dryers

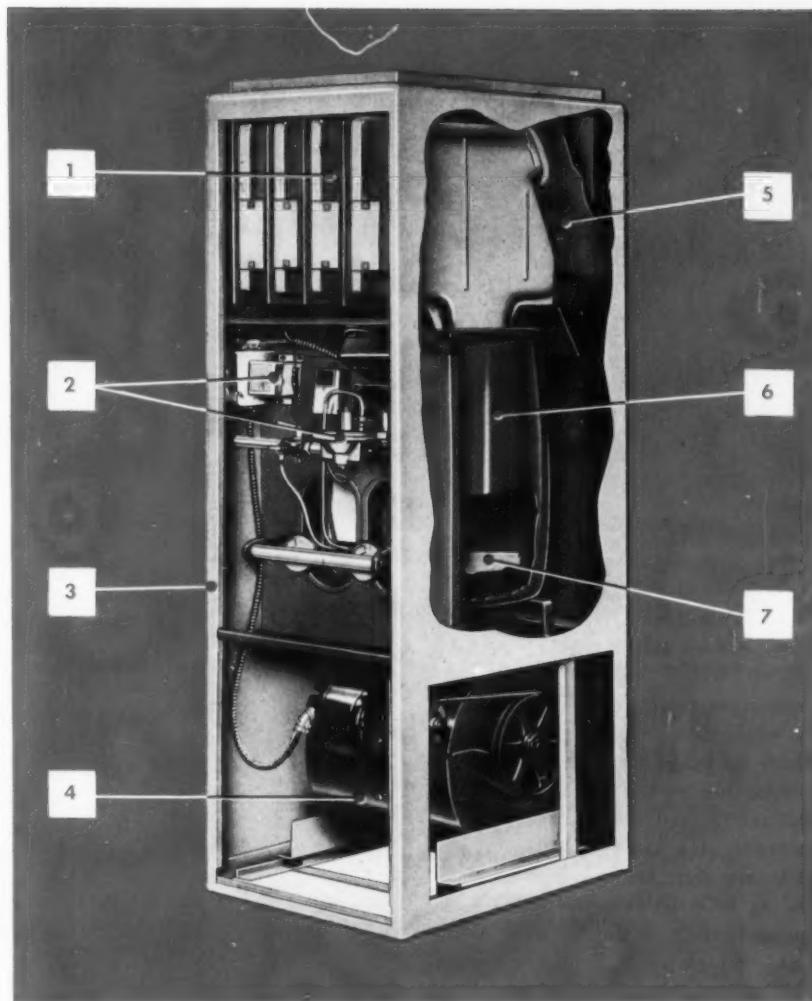
Production of Rheem-Wedgewood home laundry dryers is accomplished in the plant where heating and air conditioning equipment is built.

Fabrication of cabinets and major parts for the dryer is handled in the same fabrication section used for other heating equipment.

#### Dryer parts are flo-coated

Dryer parts get the same cleaning and phosphatizing treatment as outlined for home heating equipment. Following the power washer, however, the

*to Page R-50 →*



### RHEEM Imperial Highboy WINTER AIR CONDITIONER

**Radiators** — Multiple radiators provide a large heat transfer area to extract heat from an intimate contact with the hot flue gases. Continuously welded throughout, the pre-formed sections permit free movement and eliminate expansion noise.

**Controls** — The controls are fully automatic and centrally grouped to provide easy inspection or to make any necessary adjustments. This unit is equipped with a combination fan and limit control. The fan control starts and stops the blower in response to the temperature change. The limit switch automatically prevents over-heating. Specially designed pressure regulator assures proper flow of gas to the burner regardless of pressure conditions. It is also equipped with an automatic pilot that shuts off gas in case of pilot failure.

**Embossed Steel Cabinet** — The steel jacket is "rigidized" (embossed) for extra strength. All controls, motor, blower and filter are accessible through removable front panels.

**Filters** — Extra large filters provide effective cleaning by the low velocity air movement.

**Large Blowers** — Cushion-mounted blowers deliver a large volume of air. This promotes high heat recovery and provides proper heat distribution throughout the home by permitting close balancing of the duct system.

**Metal Liners** — These liners provide sturdy unit construction and minimize heat loss through the blower jacket.

**Combustion Chamber** — The Rheem "flame shaped" combustion chamber is contour-formed to fit the natural flame pattern from the gas burners, creating a scrubbing action of the hot flue gases for maximum heat extraction.

**Burners** — Cast iron burners are precision-tailored specially for each type of gas by proper sizing and arrangement of ports for best performance.

**Summer Fan Switch** — Summer air circulation can be obtained by flicking the switch for constant blower operation. Winter settings are not disturbed.



*Left: Midway point on the assembly line for Rheem-Wedgewood Dryers.*

*Below: Final test point on the assembly line for Rheem-Wedgewood Dryers, which leads to packing and assembly line.*

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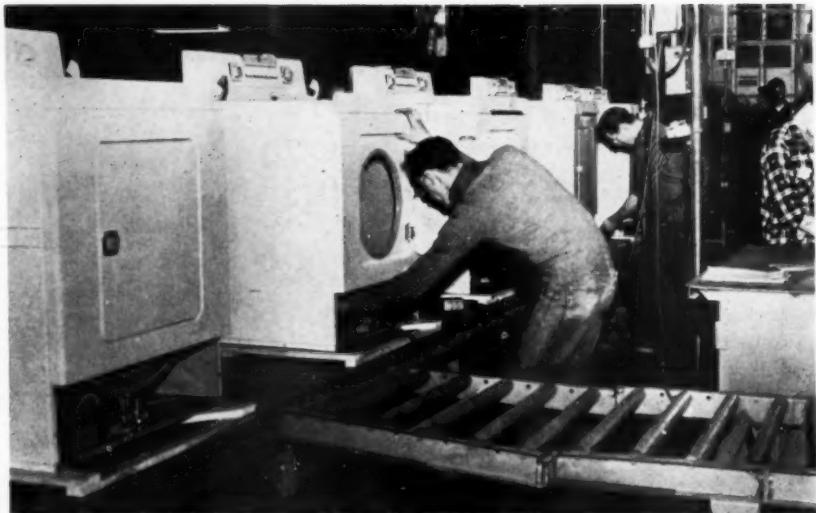
### **Heating, drying and air conditioning**

→ from Page R-49

dryer parts enter a flo-coating unit for the application of an epon type primer which is baked at 400°F. Parts for exterior use go through the same first coat routine and are then taken off the conveyor at a sanding area. Exterior parts are then loaded on a conveyor leading to a water wash spray booth for application of finish white. White coat is a high solids, hot spray application for maximum film thickness. Final finish consists of 1/2 mil of primer and a 2 mil cover coat.

White finish feeds from a 60 gal. pressure tank through an air operated pump to the paint heater and to line filter and return — a continuous circulating system between pressure tank and filter.

All small components for the dryer are fed to the main assembly line and



stored at that point in sufficient quantity for a production shift. Except for one "switch" conveyor for shunting any unit not meeting final inspection or requiring special handling, the main

assembly line leads straight to the packaging area. This packaging is an extension of the main assembly line. The conveyor slopes to floor level following the packaging operation.

### **The production of glass-lined water heaters**

→ from captions Pages R-18 & R-19

#### **Spraying methods and equipment**

The photographs showing the spraying operations on flue and bottom assembly and shell and head assembly on page 18 were taken in the Rheem South Gate plant. In this instance, the loading of steel shells (tanks) is done by hand and one shell is sprayed at a

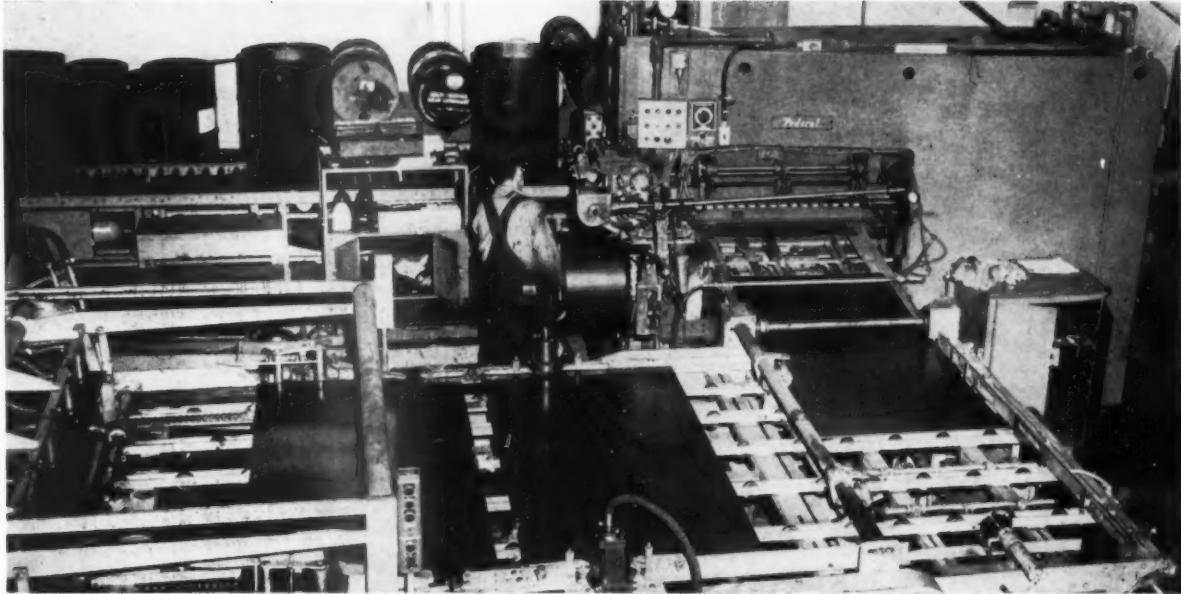
time. The flues are also hand loaded onto the turntable and automatically sprayed.

In the Chicago plant, a dual set-up is used where an indexing conveyor moves the tanks in front of the spray machine and two tanks are sprayed simultaneously. The flues are hung on an overhead, rotating conveyor which indexes in front of the automatic spray machine. They are then sprayed and moved forward automatically to the next station.

#### **Blast cleaning**

It will be noticed in the photo on page 19 that the blast equipment cleans both the flues and shells. The equipment is designed for alternating between the flues and shells. This is representative of the South Gate and Sparrows Point plants.

In the Chicago plant, there is one rotating-type machine for blasting flues and a separate overhead conveyor-type machine for blasting the shells.



Federal Automatic Drum Welder at work in Rheem's South Gate, Calif. plant. Other Federal Drum Welders are working for Rheem at their Linden, Houston, Sparrows Point, New Orleans plants. Many other types of Federal Welders are working on dozens of other operations within the Rheem organization.

## RHEEM, TOO, RELIES ON FEDERAL-WARCO

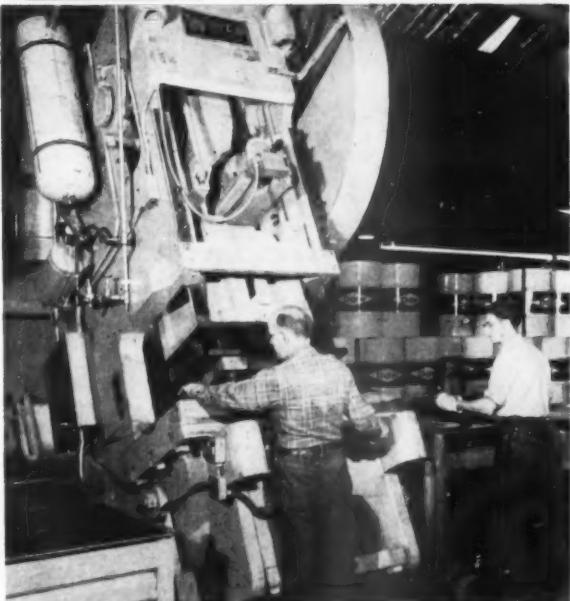
for better  
production  
machinery

Rheem Manufacturing Company is another in an ever increasing list of leading manufacturers who rely on Federal Resistance Welders and Warco Presses to assure real long-term production economy.

If you're not already acquainted with the extra quality and added service familiar to Federal-Warco users, why not take a tip from industrial leaders like Rheem and request quotations when next you're in the market for press or welding equipment. There's a representative near you.



The Federal Machine and Welder Company - Warren, O.



Warco 200-OBI Presses stamping out drum heads. Dozens of other Warco Presses are used by Rheem for all phases of presswork from appliances to ammunition shells.



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*across the continent*

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**MORGANTOWN, WEST VIRGINIA**

... a dependable source for nearly fifty years

# ...And for wire

## RHEEM SPECIFIED

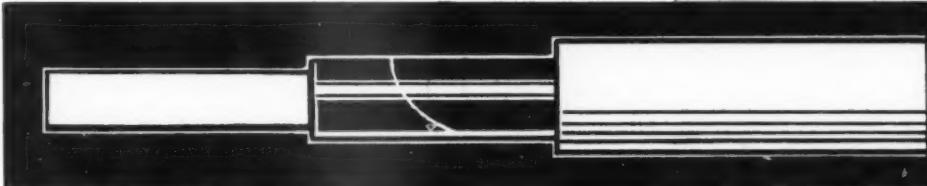


Extra high standards demanded for all components, add up to a top-quality Rheem water heater.

Continuous immersion in water for a minimum of 200 hours (as opposed to 3 hours required by Underwriters Laboratories) . . . followed by a 1200 Volt breakdown . . . were among the series of rigid tests used by Rheem in selecting the wire lead to heating elements.

The Continental heat- and moisture-resistant lead-in wire chosen met all of Rheem's high standards for quality and performance.

**AT YOUR SERVICE.** Continental's industrial wire and cable specialists are available to advise and recommend the best wire for your particular requirements. Write or call today.

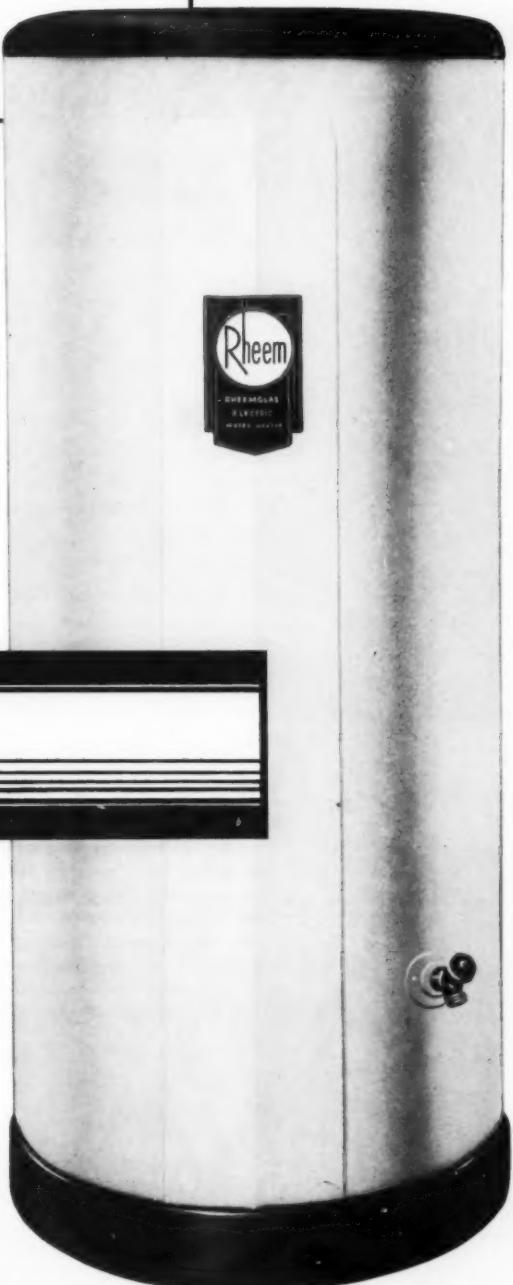


TYPE AF-P FIXTURE WIRE

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Recommended for water heaters, washing machines, dish washers, clothes dryers, etc. Special types available to meet extra rugged requirements as in the case of Rheem.

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# Coors high density grinding balls produce these results...

"GRINDING TIME CUT TO 4½ HOURS"

"NEED FOR ADDITIONAL MILLS WAS ELIMINATED"

"MILLED ENAMEL COMES OFF COOLER"

"NO BALLS HAVE TO BE ADDED WITH EACH BATCH"

"NO BALLS ARE SCRAPPED FOR BEING OUT OF ROUND"

"LINING WEAR IS LESS"

"AFTER 2½ YEARS OF OPERATION WITH COORS BALLS, WE ARE CERTAINLY PLEASED"



R. W. Smith, Enamel Foreman, The Murray Manufacturing Co.

## The Murray Manufacturing Co. says:

"We began using Coors High Density Alumina Ceramic Grinding Balls at a time when we were considering additional mills to take care of our schedule."

"With the Coors High Density Grinding Balls, we were able to cut our grinding time from between 7 and 8 hours to 4½ hours on the 1,000 pound mills. We were able to meet our schedule without adding mill room equipment, and still have idle time on our mills. We had cut milling time 40%.

"Maintenance cost on mills went down, because we eliminated the extra grinding time. We did not have the excessive amount of unground frit. Milled enamel came off cooler, and

we were able to obtain a more uniform set. No balls are added with each charge. Mills are now dumped once a year (we had to dump conventional charges every 35 grinds and scrap around 300 lbs. from being out of round, broken, etc.). We dump now only to inspect linings. No Coors Balls are scrapped as they wear even and are still in good shape."

"We do not have Coors High Density Linings in our mills at present, but with the conventional lining, wear is less than with other balls over a year of the same amount of slip milled.

"After 2½ years of operation with Coors High Density Balls, we are proud to express our opinion on a

product which has done so much for us," R. W. Smith, Enamel Foreman, The Murray Manufacturing Co.



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General view of the main research laboratory area  
of the Chicago Vitreous plant.

## CHICAGO VIT RESEARCH BENEFITS THE ENTIRE INDUSTRY

Expanding the market for porcelain enamel has always been a long range objective of Chicago Vit. Result—product developments and coatings that have increased the use of porcelain enamel; new techniques that have simplified the production of porcelain enameled parts; improved methods that have contributed to a greater operating efficiency and reduced costs in porcelain enameling plants everywhere.

These are but a few of the many ways the Chicago Vit program of

continuous research benefits those companies engaged in porcelain enameling operations.

We hope that you will consider our research and development facilities an adjunct to your shop . . . an easy, sure way of solving enamel problems that may arise from time to time. Contact your Chicago Vit sales or service representative. He will give you on-the-spot advice and help, and will tell you the many ways the Chicago Vit laboratories can be of assistance to you.

*Chicago Vitreous* CORPORATION

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Operation 6 on the washer caster bracket is spotwelding the return flange (2 spots).

by accepting "nuisance" jobs and meeting them with tooling ingenuity, a tool and stamping organization has built up a thriving metal fabricating business as . . .

## Short run specialists in metal stamping

by *V. W. Danielson* • PRESIDENT, V. W. DANIELSON MANUFACTURING COMPANY

### finishfotos

SINCE its formation in 1944, the V. W. Danielson Manufacturing Company of Milwaukee, Wisconsin, has come to be known as specialists in what engineers popularly term "short run production work."

While we do contract to make large quantities of a product in a short period of time, most of our work consists of delivering medium or small quantities of the same part over an extended length of time, or in delivering a small number of specialized parts as a single, completed order.

It is quite evident that neither of these last two categories of work conforms to continuous production line requirements nor to a tooling program geared to a continuous production line. When such a job occurs, it assumes the

proportions of a "nuisance" to the regular production and tooling programs, and it is often cheaper to "farm it out" than to make the necessary production and tooling provisions for its completion.

We are the recipients of many such jobs. By having a company such as ours do work of this kind, finished product manufacturers avoid the cost control, scheduling and tooling problems incident to intermittent and small quantity production. A small or medium size stamping company literally can serve as a "sub-assembly line" for a large producer.

#### Tooling service advances flexibility

Part of the flexibility in this connection stems from having facilities for pro-

viding tooling service. We often assume responsibility for the design, development and production of the tools necessary to complete an order, as well as for the delivery of the finished stampings or parts. Thus, to a customer, solving his "nuisance" job becomes almost as simple as purchasing a standard item.

Our premise has always been that the secret of a successful metal stamping job, regardless of its size, lies in good tooling. Our facilities include a tool and die shop having a floor area of 5,000 sq. ft., located at West Bend, Wisconsin, and a stamping and fabricating plant at our home office in Milwaukee.

We are often called upon to determine the practicability of producing intricate stampings, to make temporary draw tools for sample parts or to develop tools

for use by product manufacturers in their own plants. We are assisted in this work by the hundreds of draw dies we have on hand, many of which can be altered for "special" jobs.

In addition to this tooling work, we do production stamping, welding, brazing and prime coat painting. Our production work is accomplished using a variety of metals. While most of our draw work is done with cold rolled steels ranging from 10 to 22-gage, we also work with aluminum, brass and copper.

In special short-run work job quantities may run from 5 to 1,000 parts; on regular production work quantities upward to a million parts are not uncommon.

#### **Step-by-step operations on typical stamping jobs**

At the suggestion of *finish* editors, I will outline the step-by-step operations on a few routine stamping jobs that are currently running.

##### **Automatic washer caster bracket:**

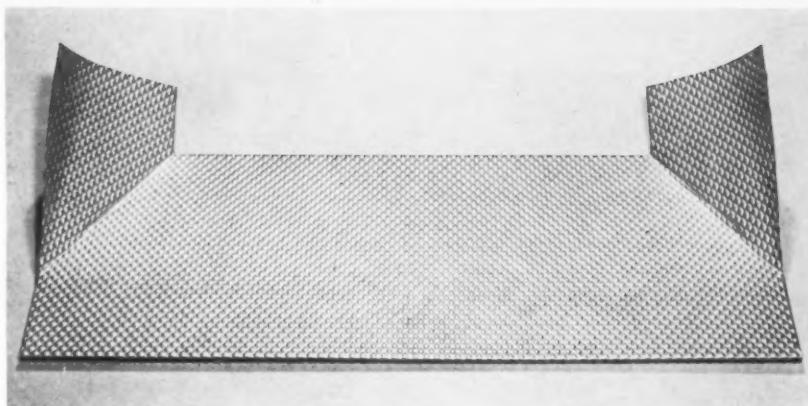
1. Blank and perforate from  $3\frac{1}{8}$ , 14-gage strip stock (random length) on open gap 50-ton press.
2. First form on 70-ton back gear press.
3. Notch on 35-ton open gap punch press.
4. U form on 40-ton open gap punch press.
5. Curl (for caster opening) on 35-ton open gap press.
6. Spot weld return flange (2 spots).
7. Stamp 12 projections on 60-ton straight side press for projection welding operation conducted in customer's plant.

##### **Chutes of rigidized metal for vending machine:**

1. Shear to size on 72" square shear.
2. Blanking (2 operations)—blank  $\frac{1}{2}$  reverse and blank  $\frac{1}{2}$ .
3. Deburr on rubber wheel.
4. Produce  $\frac{3}{8}$ " flange in press brake.
5. First form in hydraulic or a 250-ton straight size mechanical press.
6. Wrap sides in 30-ton punch press. Wrap first side, reverse in die and wrap second side.

##### **Shroud for gasoline motor:**

1. Shear 22-gage stock to size on square shear.

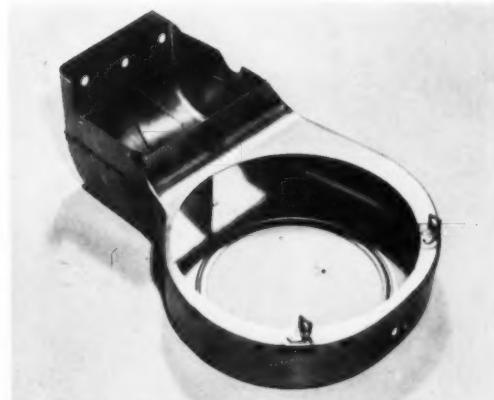


*Above: There are six operations in the fabrication of this chute for delivering milk containers in a vending machine. Use of rigidized metal prevents container's sticking to chute.*

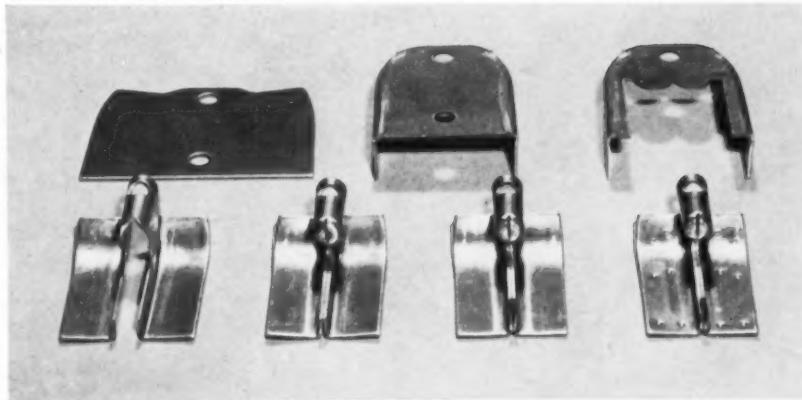


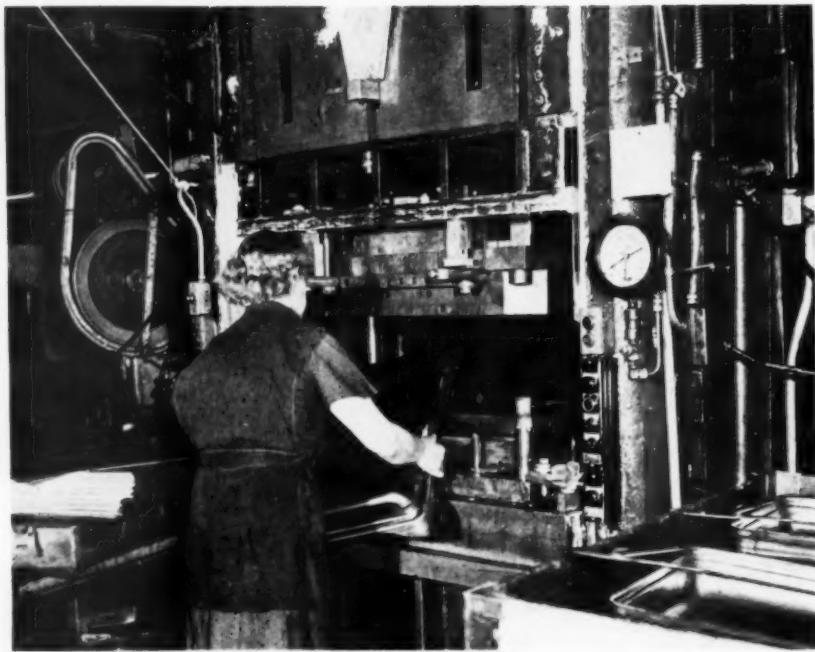
*Left: This housing is blanked from 12 ga. drawing quality steel, drawn, trimmed and pierced by Danielson. The customer completes the fabricating operation and inserts a babbitt lining to form a crankshaft bearing for diesel engines.*

*Below: There are 8 fabricating operations, plus degreasing and the application of a primer coat involved in the production of this gasoline motor shroud, thousands of which have been produced at Danielson.*



*Below: This shows the 7 progressive steps in the fabrication of an automatic washer caster bracket. Steps include blank and perforate, first form, notch, U-form, curl, spot welding and stamping projections.*





*In this 250-ton hydraulic press, draw and pinch-off operations are accomplished on a cabinet section for an electrical control box.*

2. Draw and pinch off on 300-ton hydraulic.
3. Perforating top holes and side holes on 60-ton straight side.
4. Degrease in vapor degreaser.
5. Spot weld extension (cover for cylinder head fins).
6. Spot weld back of shroud to body.
7. Weld in baffle.
8. Spot weld 2 motor mount brackets.
9. Degrease in vapor degreaser.
10. Paint — 1 coat primer.

The variety of items normally produced can be judged from the following specific examples: gear case for a lift truck; control box cover for electrical control systems; X-ray machine cover; oil pan for gasoline motor; water

jacket for diesel engine; instrument panel for airplane; cap for electric fan; drip pan for vending machine; a 12-gage pressure tank for a spraying system, etc.

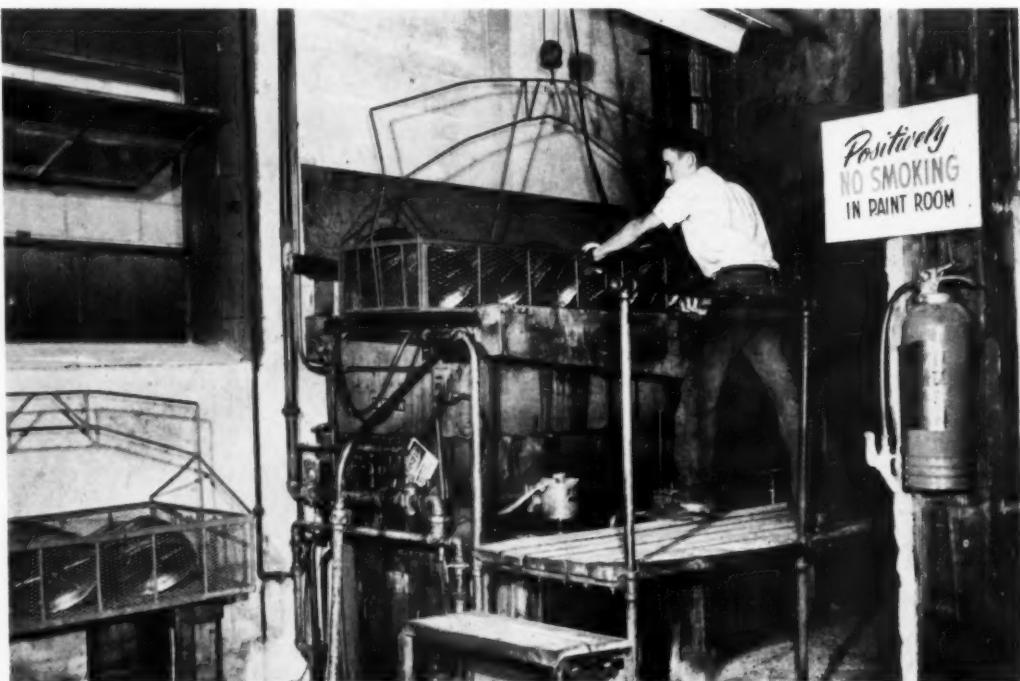
One interesting job is the main chassis for a room air conditioner which required 38 operations of stamping, forming and welding.

#### A challenge for tool designers

There is nothing very dramatic or unusual about the operation of a small sheet metal fabricating plant, but almost every day brings a challenge for the ingenuity of the tool designers to meet the need for some new product or component part. It is this phase of the business which makes it interesting — the development of a better or more economical method of producing these secondary but sometimes very important parts.

The fact that the need for relatively few parts on a large production line may create a "nuisance job" insofar as that particular production line is concerned does not belittle the job in any way to the plant specializing in short run work. To the specialist such jobs are common, and he solves them, not by amortizing huge tool costs over thousands of parts, but by exercising initial ingenuity to keep tool costs low and in proportion to the number of parts required.

*In what is probably one of the world's most compact finishing departments, the company is prepared to degrease and apply prime finish coats on small and medium-size-components.*



This "Famous Name"  
in "Fans"  
finishes 2500 lbs./hr.

Mr. W. N. Thomsen, Supt.  
Signal Electric Division  
King Seeley Corporation

- has this to say!

The ovens are very quick to react to the various settings which we vary from time to time... most pleased with the degree of control we have been able to achieve with our Burdett Radiant Fired Ovens.

I am sure that if your process requires a ~~convection~~ oven that the Burdett Radiant Fired Oven will give you very good performance - trouble-free with a minimum of maintenance costs and adjustment.

We are proud of such direct, specific words and particularly so when written unsolicited in reply to an inquiry from another "Famous Name" prospect about Burdett equipment. Thank you Mr. Thomsen!

This System —

Bakes—12 minutes at 325°F.

Operates—at 11 FPM conveyor speed.

Produces—hard, very high gloss finish at new low in cost.

It consists of —

One 3-stage power spray washer

One Dry-Off oven — 3 min. at 400°F.

Two 12' Water washer spray booths

One #348 conveyor

Every Burdett "Radiant Heat" Finishing System is engineered to specific production and product requirements — which with the proved advantages of "Radiant Heat" combine to give you a more durable finish, in less time, with interesting savings in production costs.

Whether you contemplate a new finishing department or a conversion of present equipment — or, merely a separate oven addition to your present equipment —

**Be Sure it's Burdett — either "Radiant" or "Convection"**

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MANUFACTURING COMPANY

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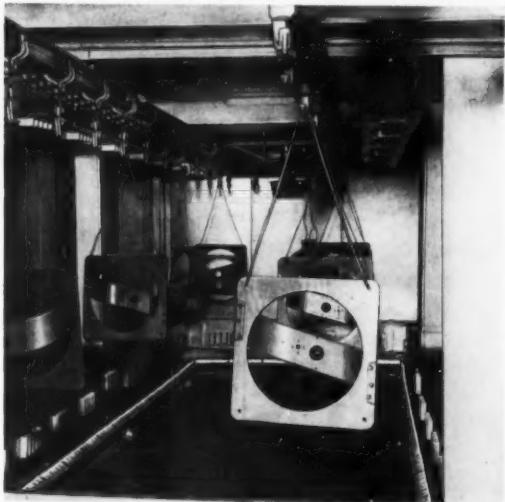
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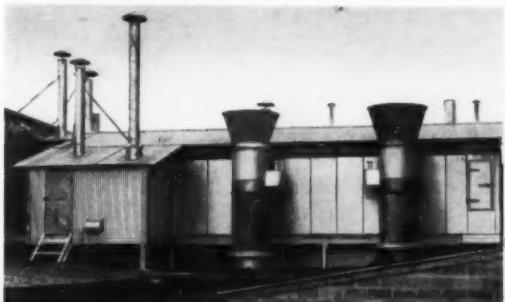
**NEW BURDETT**  
*"Radiant Heat"*  
Multi-Pass—Roof-Mounted  
Finishing System



Side view of 3-stage washer showing one-stage pump and control panels for Bake Oven and Washer.



Interior of 2-pass Dry-Off Oven, Burdett No. 10L Radiant Line  
Burners shown on both sides.



Exterior view of Burdett Paint Baking Oven, showing location on plant roof. Saves valuable floor space.

**Write for  
the Burdett Story!**



James Emmett, Jr., president of ARI, delivering the welcoming address during the official opening.

**C**ONVENTION Hall, Atlantic City, N.J., was the scene of the 9th Exposition of the Air-Conditioning and Refrigeration Industry. It was held from November 28th through December 1st and was sponsored by the Air-Conditioning and Refrigeration Institute.

Although the ARI had no general meetings during the show, five other industry groups did meet in conjunction with the exposition. They were: Air-Conditioning & Refrigeration Contractors Association, Air-Conditioning & Refrigeration Wholesalers, American Society of Refrigerating Engineers, National Commercial Refrigerator Sales Association and Refrigeration Service Engineers Society.

On the floor of Convention Hall 252 companies exhibited approximately 6,000 pieces of equipment and parts and covered 86,000 square feet of exhibit space. This was the largest show the industry has ever conducted. It was one-third larger than the last show (Cleveland 1953) and twice as large as the last show held in the East (Atlantic City 1949). 6,438 individuals had registered at the exposition by closing on Monday November 28th. The overall record attendance for the entire show was 13,376.

The one important thing noted at the show was the overall feeling that this was the best show the industry had ever had, and that businesswise the future looks excellent for the entire industry.

optimism and "biggest year ahead"—describe the general feeling of the . . .

## 9<sup>TH</sup> Air Conditioning and Refrigeration exposition

Here are just a few of the optimistic comments picked up during the show:

*J. A. Hall, market manager, Reynolds Metals Co.*, "We are very pleased with the show. Visitors have shown keen interest in all of our products. Of particular interest is our copper colored anodized refrigerator door."

*R. C. Roll, executive vice president, Betz Corporation*, "We have had a good year and expect business to be up 25% in '56. Competition in the air conditioning industry has gotten tougher with most of the 'big boys' taking over. I look for central air conditioning to be up about 20% this coming year."

*A. H. Rose, general sales manager, Sub-Zero Freezer Co., Inc.*, "Response at the show to our new built-ins has been tremendous. At this stage it looks as though our big problem will be maintaining production to meet demand for our new built-in refrigerators and freezers."

*John H. Marling, sales manager, controls division, Jackes-Evans Manufacturing Co.*, "We doubled our controls business in 1955 over 1954. We expect a further increase in 1956."

*John B. Meyer, air conditioning specialist, Rheem Manufacturing Co.*, "We have been very well received at the show. It is the first time that we have had a booth. We are looking for a good year in 1956."

*C. E. Buchholzer, president, Airtemp Div., Chrysler Corp.*, "Our packaged air conditioner line has been completely restyled. We are also conducting a new "trade-in" campaign designed to get present owners to trade old and inefficient equipment on new models. We are

likewise in the midst of an incentive plan for retail salesmen to stimulate the finding of prospects and pre-season selling. Our marketing estimates call for a 20% increase in the packaged air conditioner division."

### Residential central air-conditioning sales up 30%

*Geo. S. Jones, Jr., managing director, ARI*, had this to say to our editor: "The show reflects the fact that '55 is the best year in industry history. '56 should be a better year. Residential central air-conditioning sales are up about 30% and will pass the 100,000 unit mark for annual sales. Next year should see another 10 or 15 per cent increase. I expect 1½ million units to be sold in 1956 with any kind of a weather break. There will be more un-air-conditioned homes in January '56 than there were in January '55." This, of course, means that even though the industry is expanding rapidly, it still isn't keeping up with the expanding market. This certainly is a challenge to the industry for further increased promotional and sales efforts.

### Examples of equipment displayed

Of the thousands of items of equipment and parts on display at the exhibition, here are just a few that caught our editor's eye:

*Union Asbestos & Rubber Company, Chicago*, exhibited "Royal-Aire", a self-contained, water cooled packaged air conditioner, which can also be equipped with a heating coil. It was presented as the only packaged unit equipped with a pump-down control system.

*The Mitchell Manufacturing Company, Chicago*, introduced a line of self-

contained commercial air conditioners in 2, 3, 5 and 7½ ton sizes, both air and water cooled, featuring Slide-A-Way chassis with cleanable condenser and Electromagic Filter Eye.

*United Refrigerator Company*, showed a freezer line consisting of uprights in 12, 17, 21 and 32 cu. ft. capacities, as well as the "Refrig-N-Freez", refrigerator-freezer combination. All were styled with interiors in soft green trimmed in gold and exteriors of white baked enamel with gold trim.

*Keco Industries, Inc., Cincinnati*, displayed the largest self contained air conditioner, the trailer mounted G-2 unit, which is driven by a six cylinder engine and produces eleven tons of cooling.

*Dryomatic Corporation, Alexandria, Virginia*, unveiled its new Model T-150 dehumidifier which is designed to maintain humidities as low as 10% in areas up to 60,000 cubic feet over a wide range of temperatures.

*Rheem Manufacturing Company, Chicago*, featured an Add-On air conditioning unit, a companion piece of equipment which may be added to warm air systems or, in homes without furnaces, may be used as the central unit of an independent air conditioning system,

From left to right: George Mills, show director and assistant director ARI; James Emmett, Jr., president ARI; F. G. Coggin, exposition chairman, and Geo. S. Jones, Jr., managing director ARI.



with either air cooled or water cooled condenser.

*United States Air Conditioning Corporation, Minneapolis*, demonstrated a fully-operating replica of a waterless residential cooling installation.

*General Electric's Commercial and Industrial Air Conditioning Department, Bloomfield, New Jersey*, showed new horizontal packaged air conditioners which can be fastened to the ceiling or mounted on a shelf.

*York Corporation, York, Pennsylvania*, introduced a two-part hermetic residential air conditioning system. The compressor and air cooled condenser

can be located completely outside the air conditioned space, with the cooling coil or evaporator installed as a part of the furnace, or in the sheet metal duct work leading to the furnace or the fan section.

*Marlo Coil Company, St. Louis, Missouri*, displayed Seazonaire remote room air conditioning units, floor and ceiling types; a unit cooler for refrigerated storage areas; and other units.

*Carbonic Dispenser, Inc., Canfield, Ohio*, presented their SodaMaster self-contained, self-refrigerated soft drink dispensers.

General view of 9th Exposition at Convention Hall.



**For Every Product from  
Gas Cylinders to Boats . . .**

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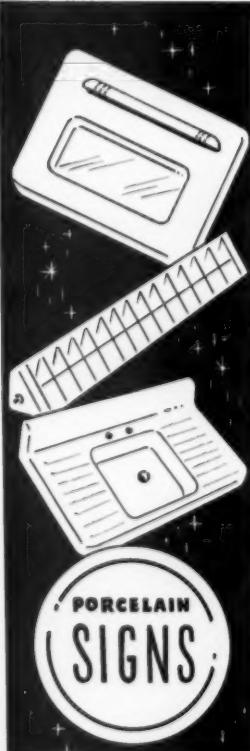
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Send today, on your company letterhead, for this valuable full-color guide to every industrial problem in marking, identification, instruction, and information. Gives you hundreds of new ideas for application of decals to your products.

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PORCELAIN  
ENAMELING  
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COLOR..our specialty**

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**THE ENAMEL PRODUCTS CO.  
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*Its versatility  
makes it a "must"  
in every  
shop!*

The Vonnegut Brush-Backed Polishing Head, in a choice of diameters and abrasive widths, is versatile in the OPERATIONS for which it can be used, in the MATERIALS and the SHAPE AND FORM OF SURFACES to which it can be applied. It will sand, polish, debur, flat or contoured surfaces—on wood, metals and other materials. Write for Bulletin No. 102 for full description.

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Your Inquiry Nov. 1st  
Customer Part No. Experimental  
Cuyahoga Part No. MC 3069*



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STAMPINGS  
STUD CLIPS  
SCREW FASTENERS  
MOULDING CLIPS  
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SPECIAL COLD HEADINGS  
In all Metals!**

**The CUYAHOGA SPRING Co.**  
SUBSIDIARY OF THE BARIUM STEEL CORP.  
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## HOT DEVELOPMENT IN STEEL SPRINGS—THE TORQUE BAR

THE hottest new development in steel springs is the torque bar, according to a leading steel producer.

Now in widespread use as the energizer for lifting automobile trunk lids, it is represented as showing excellent possibilities for an increasing variety of applications for manufacturers of appliances, machinery, etc.

A finished torque bar, 43 inches long and weighing 1 1/4 pounds, is reported to give a trunk lid an upward thrust of nearly 400 inch

pounds and is reputed to be capable of outliving the car. The bar for an auto trunk lid is made from .343-inch diameter high carbon oil tempered spring wire having a tensile strength of approximately 200,000 psi and a yield strength of not less than 150,000 psi.

In forming the bar, it is given a total of 11 bends. Five of these are 90 degree bends on a radius less than the diameter of the wire. Uniformity in the material is extremely im-

tant. In the plant of Precision Spring Corporation of Detroit, test samples are checked for stress, strain, characteristics, tensile strength, elastic limit and yield strength and results are electronically charted on a graph.

Finished bars are tested on special equipment. In the case of the torque bar for trunk lids, the maximum torque load of between 720 and 900 inch pounds is suspended from the bar for 24 hours. Then the bar is tested for working torque load of between 320 and 397 inch pounds to make certain that it will not take a set or fail in service.

*Left: Torque bars, made from a high quality oil tempered spring wire, must meet exacting test requirements before they are shipped for installation in automobiles to raise trunk lids.*

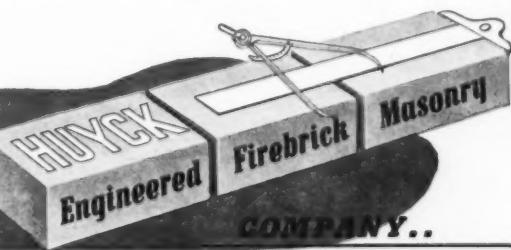
*Below: Selection of wire for torque bar production starts with the testing of samples. Stress-strain characteristics of the sample being adjusted (left) will be electronically recorded on the chart (right), producing a graph similar to that in the foreground.*



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IS GUARANTEED  
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**make** **the invisible ingredients** **NORTHWEST products BETTER!**

Northwest Chemical quality is equal to any in the field. Their formulas are based on careful research and long experience. The steady growth of the company and the acceptance of their products is due to the invisible ingredients compounded in each shipment going into a customer's plant.

Those ingredients which give Northwest Chemical customers a superior product are the careful, individual attention given each customer's requirements, expert analysis of the job to be done plus the technical ability and experience to produce basic formulas to exactly the point of top efficiency in each case and by constant stand-by service, to keep them that way.

That is the reason Northwest Chemicals are specified by an ever increasing number of the country's top manufacturers.

Remember—the cost per finished article is the true cost of your cleaner. Northwest's stand-by service keeps the job right.



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serving you since '32

pioneers in pH cleaning control



*January · 1956*

# gate transit

**FROM ASSEMBLY LINE TO FINAL CUSTOMER**



## **AIM\*** to reduce in-transit damages on appliances with **Acme Steel Strapping Ideas**



Acme Idea Man  
Ed Peterson  
continues to  
recommend  
new, better  
packaging and  
shipping  
methods.

ask your  
**\*Acme Idea Man**  
to help solve your  
problems

Since using Acme Steel's "anchor load" system of freight car bracing, in-transit damage has dropped to a new low for Deepfreeze Division, Motor Products Co., North Chicago, Illinois. Idea 448. The entire load is securely anchored to car walls with Acme Steel Unit-Load Band. Freezers stay in place . . . aren't marred or smashed by jolts. Result? Damage claims are greatly reduced. Unloading is speeded too. Just cut bands, unloading begins. So consignees as well as shipper save time and costs.

Your Acme Idea Man will gladly show you how to protect your shipments better and at lower cost. Call him today. Or write Acme Steel Products Division, Dept. RS-16, Acme Steel Company, 2840 Archer Avenue, Chicago 8, Illinois.

ACME STEEL PRODUCTS DIVISION

# ACME STEEL COMPANY

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**ACME  
STEEL**

# safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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CONBUR COMPARISON DATA

FROM SAFE TRANSIT TESTS . ST-4

BUILT FOR 6000 LB. LOADS —

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SAFE TRANSIT NEWS ..... ST-9

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1440 WEST 21ST PLACE • CHICAGO 8, ILLINOIS

## Conbur comparison data from Safe Transit tests

this data illustrates the absolute necessity of using instrumentation in connection with the operation of incline impact test equipment

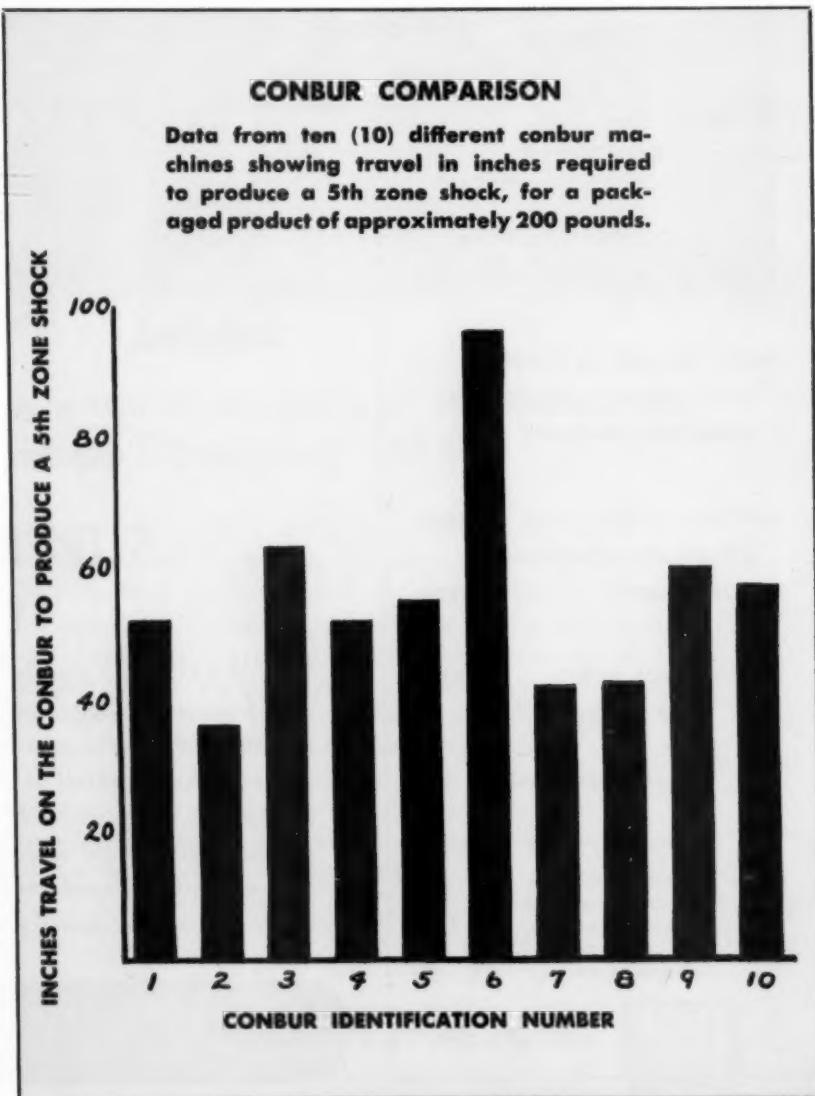
THIS chart shows the variation in different conbur machines which are located in various states over the nation. This data was obtained from the various laboratories and manufacturers who have their own conbur machines.

This particular chart was made up from the data involving packaged products of approximately 200 lbs. so that it would show one weight category only. A shock recorder was used in every instance to record the zone of shock. The inches of the travel on the conbur machine was the distance from the backstop to the point of release of the dolly on the incline, which was required to produce this 5th zone shock. It is interesting and extremely important to notice the variation.

As an example, conbur machine identified as #2 required 36", while conbur machine identified as #6 required 96". Factors which usually contribute to these extreme variations are such things as: friction in the wheels as to line up to the track, weight distribution of the packaged product, characteristic of the backstop, method of release at the point of release and others.

This chart points out the absolute necessity of a shock recorder in setting up National Safe Transit tests. It also points out that such recorders should be used each time the packaged product, as to type and weight, is changed, and also sufficient checks on the same packaged product going through repetitive tests to assure the operator that no extreme variables have entered the picture.

Additional information on other piled and will be available at a later weights and conditions are being com- date.





## This free booklet may save you thousands of dollars in shipping costs

Here's a big, 24-page, illustrated booklet packed with basic facts on shipping containers — and shipping problems — that has shown others how to save thousands and may do the same for you.

It tells you about Atlas Plywood's free service that enables you to find out: (1) whether you can get a safer shipping container; (2) whether you actually *can* cut your present shipping costs; and (3) just *how much* you can save.

It tells you how Atlas Plywood containers are made, how they're engineered to meet your shipping requirements — and how they earn their lab-tested label in our modern laboratory, equipped with the latest container testing devices.

What about your own present ship-

ping containers? Are they:

- causing damage claims, due to inadequate product protection?
- boosting your freight costs because they weigh too much?
- costing you extra assembly hours?

The thing to remember about these money-wasting handicaps is: *each one of them is preventable.*

This booklet tells you how — and

the sooner you get this information, the sooner you can profit by it. Ask your Atlas Plywood representative (listed in your classified phone directory) for your free copy of "How Atlas Plywood Cuts Your Shipping Costs . . . Safely." Or write to Atlas Plywood Corporation, Dept. F-5, 1432 Statler Building, Boston 16, Massachusetts.

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# WATKINS has the container for your shipping problem

Watkins Containers will cut your shipping costs. They are delivered to your factory 75% assembled and designed for quick and easy completion, to save you labor, time, and expense. Scientific design gives maximum strength, yet keeps container weight at a minimum and reduces your shipping costs.

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Only Watkins Containers provide all of these many desirable and necessary features and at no greater cost than other types of containers. Ship your carefully manufactured products safely and economically—ship them the "Watkins Way."

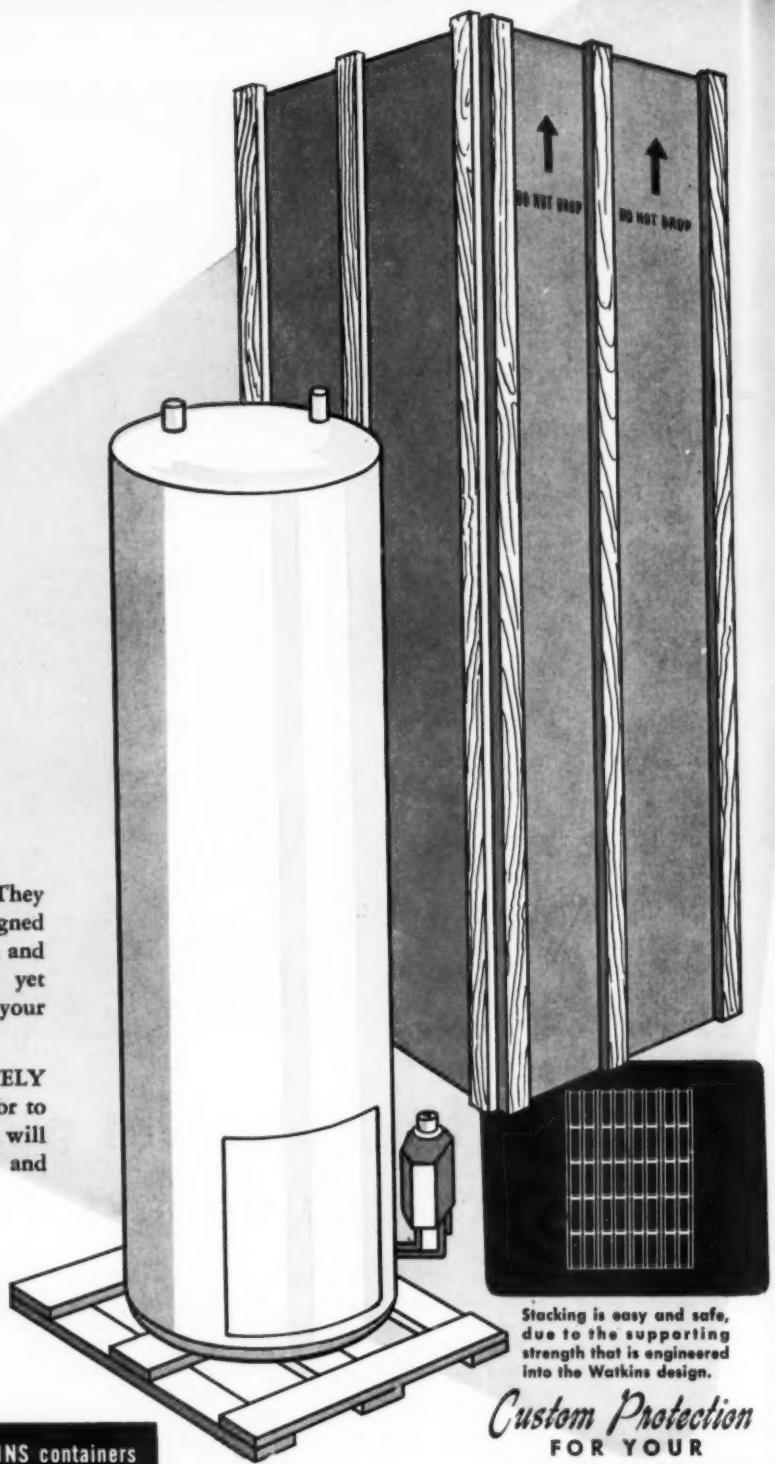
these companies build WATKINS containers

Cosier Container Corp. .... 446 East 131st Street, Cleveland, Ohio  
Crate-Rite Mfg. Co. .... 1015 Orient Street, Oakland 7, California  
Dura-Crates, Inc. .... 940 East Michigan Street, Indianapolis, Indiana  
General Box Co. .... 1825 Miner St., Des Plaines, Illinois and  
16th and Maple Sts., Louisville, Kentucky  
Hemb & Martin Mfg. Co. .... P. O. Box 108, Murfreesboro, Tennessee  
Illinois Box & Crate Co. .... 811 Center Street, Plainfield, Illinois

Kleckhefer Box & Lumber Co. .... 1711 West Canal Street, Milwaukee, 3 Wis.  
Lane Container Corp. .... 10212 Denton Road, Dallas, Texas  
Lewisburg Container Co. .... 243 Singer Street, Lewisburg, Ohio  
Livingston Wood Manufacturing, Ltd. .... Tillsonburg, Ontario, Canada  
Love Mfg. Inc. .... 608 South Commerce Street, Wichita, Kansas  
Pennsylvania Box & Lumber Co. .... Terwood Road, Willow Grove, Pa.  
Utility Grate Corporation. .... 1985 E. 16th Street, Los Angeles 21, Calif.

—an inquiry to any of these companies will get prompt attention

The • WATKINS CONTAINER • Manufacturers



*Custom Protection  
FOR YOUR  
WATER HEATER*

## Built for 6000 lb. loads

**giant impact tester and vibration machine designed for testing packages of tin plate weighing up to 6,000 lbs.**

SUCCESS of the National Safe Transit program and the test facilities used by this organization to assure safe packaging is being recognized far beyond the home appliance field. Just recently, a large producer of tin plate ordered an impact tester capable of testing packages of tin plate weighing up to 6000 pounds. This material must reach the ultimate user in excellent condition, minus any scratches, dents, or other injuries, and is particularly difficult to package due to its concentrated weight and slippery surface.

Gaynes Engineering Company of Chicago designed and built the big tester. The dolly platform is 5 ft. by 5 ft. in size, of welded steel construction, and topped with a 3/16-inch steel plate. Maximum dolly travel is 13 ft., down a pair of 18 ft. long machined steel right angle tracks. Four machined V rollers equipped with sealed roller bearings provide almost frictionless dolly travel.

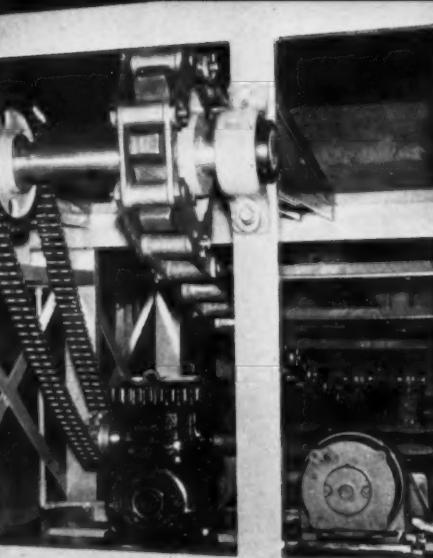
The dolly is pulled up the 10 degree inclined track by a heavy duty pintle chain. Power is provided by a 3 H.P. sealed ball bearing motor operating a variable speed reducer and a double chain sprocket drive. The power shaft

is end-mounted in self-aligning ball bearings, which in turn are contained in heavy duty pillow blocks bolted directly to the frame. The motor is controlled by a magnetic switch.

The backstop is of welded steel construction, 6 ft. square and 7 ft. high, and faced with a 1/2-inch thick steel plate. When in use, this backstop will be loaded with 30,000 lbs. of bulk sand. Heavy H-beams fan out from the back rear structural member of the backstop to brace against the backstop face plate.

When set up for use, the impact tester will be bolted to a special steel sub-frame buried in a 36-inch deep concrete apron. The 20 bolts used in attaching the tester to the sub-frame are equipped with tapered steel washer-bushings which, because of their shape, will automatically compensate for any bolt hole end play that develops after extended use.

In conjunction with the building of the impact tester, the engineers designed and built a vibration tester that will handle packages up to the same 6000

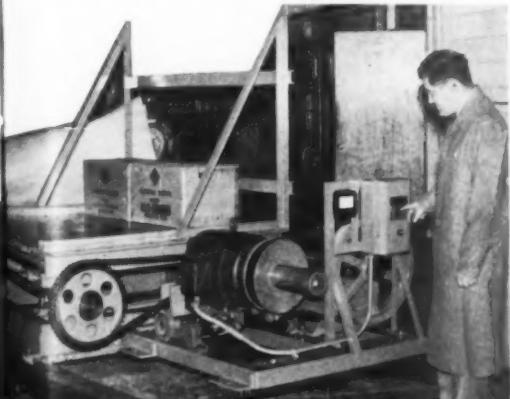


*View of power installation on 6000 lb. capacity impact tester. The pintle chain conveyor for the dolly is 8300 lbs. test. Note double chain sprocket drive from speed reducer to pintle chain shaft. Drive shaft is mounted in self-aligning ball bearings contained in frame-mounted pillow blocks.*

lbs. in weight. The platform on this machine is also of all-welded steel construction, with approximately 36 sq. ft. of surface area. The vibrator is powered by a 15 H.P. motor operating through a variable drive to provide vibration frequencies ranging from 90 to 250 cps. The 1-inch throw on each drive shaft can be shifted 30 degrees out of phase with each other. The high tensile strength steel drive shafts are each end-mounted in double roller bearing pillow block combinations bolted directly to the frame. A visual type tachometer indicates the speed at which the vibrator is operating.

While the majority of products do not require the full 6000 pounds capacity of either of these machines, the builders point out that because of the large size of each unit, several packaged products might be tested at one time.

000 lb. capacity vibration tester. Frequency range varies from 90 to 250 cps. Drive shafts can be shifted 30 degrees out of phase to increase test severity.



→  
Backstop for 6000 lb. capacity impact tester will contain 30,000 lbs. of sand and is well braced by heavy H beams. Face of backstop will be covered with 1/2-inch thick steel plate when it is placed in use.  
*finishfoto*



# Modern closing and sealing system for corrugated containers

A new type of equipment for closing and sealing one-piece slotted corrugated containers has been installed at Whirlpool-Seeger Corporation in Clyde, Ohio, for packaging Whirlpool "Surgo-matic" washers.

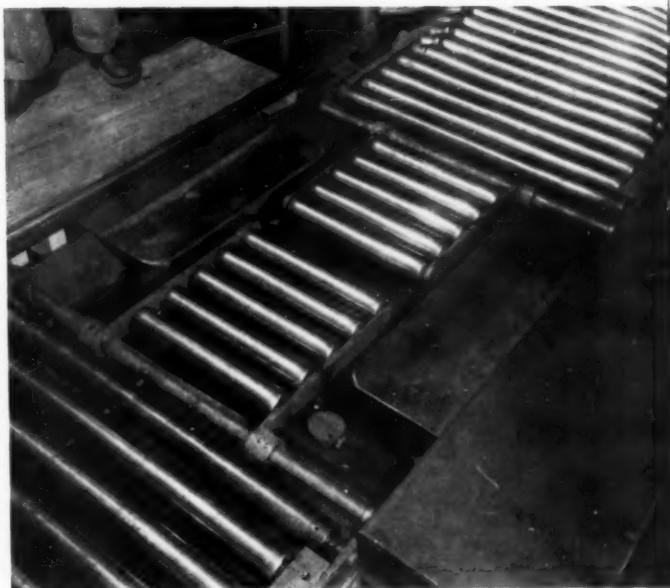
An outstanding feature of the equipment is found in a new type bottom flap closing mechanism and in a new method of closing outer flaps for sealing.

The new bottom flap closing device eliminates any necessity for loading a heavy product inside the box. With the new equipment the box is put over the product, and the inner bottom flaps are closed mechanically beneath the product.

The flap closing mechanism is power operated. Instead of plowing the glue-covered flaps shut through the use of stationary guide bars, the machine closes the flaps instantaneously. The use of this method allows the equipment to be installed in a comparatively small space.

Packing the containers is a straight line operation. They move through the equipment without the necessity for being pushed back and forth or around a right angle corner. Each unit to be

*Bottom and flap closing mechanism. Roller sections are hinged, power operated. Horizontal plates slide in and out, power operated.*



PHOTOS COURTESY HINDE & DAUCH

packed is kept on a solid base at all times.

The equipment is designed for use with regular slotted containers. Boxes used are of conventional design, with no extra scoring required.

Manufacturers of the packaging equipment recommend its use for a variety of home appliances and other fabricated metal products. Two of the early installations in the appliance industry are for home laundry equipment at the Whirlpool plant (illustrated) and at the Hotpoint plant in Chicago.

*At an earlier station on the packaging line a two man team fits the container over the washer. Two bottom flaps are down, to be closed; the other two bottom flaps are turned out to be sealed automatically later. At this location the unit has two bottom flaps out to pass over glue application rolls and all top flaps open. Packer inserts interior packing which contains washing machine lid. After interior packing is inserted, operator closes two inside top flaps and pushes unit into automatic sealing equipment. Power operated belts on roller conveyor move unit through remainder of packing operation.*



*View of glue roll detail and power driven belts.*

**For additional information on this closing and sealing system, send a request on your letterhead to finish.**

## CARRIER CONFERENCE PLEDGES SUPPORT TO NATIONAL SAFE TRANSIT COMMITTEE

The Northeastern Motor Carrier Conference has announced the passing of a resolution pledging its support to the National Safe Transit Committee. The resolution further stated that the Conference would give "its untiring effort to acquaint handling personnel with the Safe Transit label and the pre-shipment testing program behind this emblem of participation."

Passing of the resolution was announced by Mr. Dan Guseff of Branch Motor Express, chairman of the Northeastern Motor Carrier Claim Conference, and Mr. Gunther G. Weinstock of Connecticut Motor Lines, Inc., chairman of the board of directors of Northeastern Motor Carrier Claim Conference. The resolution read as follows:

*Whereas among the avowed purposes of the NORTHEASTERN MOTOR CARRIER CLAIM CONFERENCE, as set forth in its constitution, is the objective, "to train and educate the shipping public in*

*relation to the prevention of claims" and*

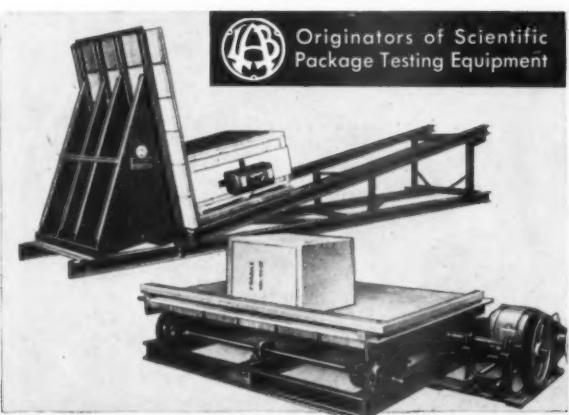
*Whereas the National Safe Transit Committee has as its purpose a related objective: reducing intransit damages to the absolute minimum through the COOPERATION OF SHIPPERS AND CARRIERS through its pre-shipment testing program, which program has become the FIRST NATIONAL STANDARD for packaged products approved by major manufacturers and carriers.*

*Therefore, be it resolved*

*That the NORTHEASTERN MOTOR CARRIER CLAIM CONFERENCE does hereby PLEDGE ITS SUPPORT to the NATIONAL SAFE TRANSIT COMMITTEE and furthermore pledges its untiring effort to acquaint handling personnel with the SAFE TRANSIT LABEL and the pre-shipment testing program behind this emblem of participation.* The Northeastern Motor Carrier Claim Conference represents Motor

Carriers in New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia and the District of Columbia. The National Safe Transit Committee now represents over 200 manufacturers who have adopted the Safe Transit pre-shipment testing Program for their packaged products. The Safe Transit tests were developed to simulate actual transit conditions and to enable a manufacturer to know prior to shipment whether or not his packaged products would withstand normal transit conditions.

Commenting on the resolution of the Northeastern Motor Carrier Claim Conference, Mr. R. F. Bisbee, general chairman, National Safe Transit Committee, said, "We greatly appreciate this pledge of support. It represents the spirit of cooperation between carriers and industry which has been the keynote of the National Safe Transit Program. As long as it exists this voluntary and cooperative movement by carriers and industry will continue to make rapid strides toward the objective of reducing in-transit damages to an absolute minimum."



### Cut shipping losses with L.A.B. Package Testers

We were the original developers of this type of package testing equipment and our machines were used in evolving the test procedures recommended by the National Safe Transit Committee and the American Society for Testing Materials. Only genuine L.A.B. testers are backed by 15 years' experience in the plants of America's leading manufacturers.

We are an ASTM certified laboratory

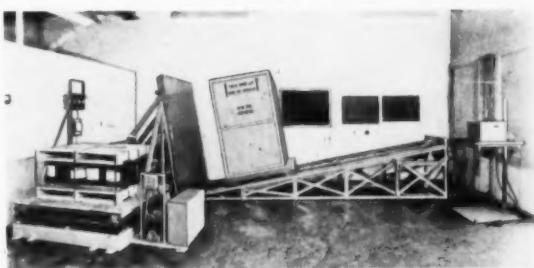
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- Vibration testers—400-10,000 lb. capacity—tables to 8' x 12'
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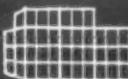
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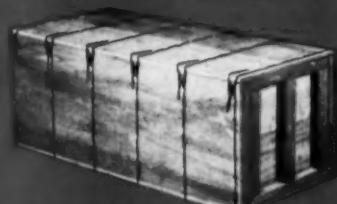


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**INGRAM-RICHARDSON, INC.**

OFFICES, LABORATORY AND PLANT • FRANKFORT, INDIANA

## The fabulous future for home laundry appliances

(Continued from Page 29)

### Industry's five-year forecast for dryers

Median Forecast For	Total Dryers	Electric Dryers	Gas Dryers
1955	1,250,000 100%	912,000 100%	330,000 100%
1956	1,300,000 104%	981,000 108%	338,000 102%
1957	1,445,000 116%	1,071,000 118%	370,000 112%
1958	1,650,000 132%	1,238,000 136%	430,000 130%
1959	1,780,000 142%	1,400,000 154%	450,000 136%
1960	1,938,000 155%	1,500,000 165%	480,000 145%

9. The steady growth of population since World War II.

10. Continued highs in new family formation, plus

11. Increasing family size, and

12. The almost complete disappearance of adequate domestic help.

13. Continued progress by manufacturers in improving distribution meth-

ods — both in the direction of full line and independent specialized outlets.

14. The increased importance of package laundry sales through designers and project builders.

15. Replacement market increases due to wider use of home laundry appliances, rapid rate of engineering and improvements since World War II.

### Industry problems

Five problems which currently face the industry and which may affect future sales were listed by manufacturers of

home laundry appliances as:

1. Rising material costs.

2. Rising labor costs.

3. Loss of production and earnings from extended strikes.

4. The ever present possibility, however remote, of a general business downturn against which no individual industry can hold out.

5. The possibility of a war or defense action of a type which has marred good business opportunities at irregular intervals through the past generation.

### Washer outlook

Automatic and semi-automatic washer sales were the greatest single element in the home laundry appliance industry. Wringer washers, however, remained an important factor among home laundry appliances. Over 1,000,000 were sold in 1955.

The industry's study of forecasts for 1955 and future years indicated a continued and substantial growth for automatic washers.

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The February issue of *finish* will be packed full of interesting and timely information for all readers.

A comprehensive feature on built-ins by Margaret Stedman will include discussions on the present market, the built-in effect on distribution, relationship between color and the built-in, photos of current products and pertinent comments by industry leaders.

GAMA and NEMA reports and forecasts for the gas and electric appliance fields will include facts, figures and predictions for 1956. (This is an annual February feature.)

How American Kitchens saves production costs of \$10 per ton on 14,000 tons of steel per year, and how another manufacturer tripled production on small metal parts by stamping pre-coated metal coil, are the subjects of two more illustrated articles.

Look for these and a number of other exclusive features in February *finish*.



## ROCKWELL PREDICTS GOOD YEAR FOR GAS INDUSTRY

According to W. F. Rockwell, Jr., president, Gas Appliance Manufacturers Association, the number of gas utility customers will approximate 30 million in 1956, and the number of LP-Gas users will raise the total of all types of gas customers to about 37 million by the end of the year. As a result, manufacturers of gas appliances and equipment are likely to top their performances of 1955 — with water heaters, furnaces and ranges leading in sales.

## SAYRE SEES RECORD APPLIANCE SALES IN '56

Judson S. Sayre predicted that 1956 will be another record year for the appliance business, with sales of automatic washers and clothes dryers totaling 5,000,000 units for the first time.

Sayre, president of Norge Div., Borg-Warner Corp., Chicago, said that industry major appliance sales will increase from 5 to 10% over 1955.

## WAMPLER PREDICTS \$3.2 BILLION IN '56 AIR CONDITIONER SALES

The air conditioning industry in 1956 will break all previous records with total sales at retail of about \$3.2 billion, it was predicted by Cloud Wampler, chairman and president of Carrier Corp., Syracuse, N.Y.

## SALES ESTIMATES OF MAJOR ELECTRIC APPLIANCES FOR 1955

The National Electrical Manufacturers Association has released the following estimates of total industry sales of major electric appliances for 1955:

electric household refrigerators, 4,025,000 (units); electric ranges (standard and built-in), 1,600,000; electric storage water heaters, 900,000; electric farm and home freezers, 1,100,000; dishwashers, 295,000; food waste disposers, 520,000 and dehumidifiers, 92,000.

## DEEPFREEZE TO GO OUT OF BUSINESS IN MARCH

The Deepfreeze Appliance Div. of Motor Products Corp., Chicago, manufacturer of home freezers, will go out of business on March 31, the company has announced.

## KOONTZ HEADS CROSLEY & BENDIX CHICAGO BRANCH

James G. Koontz, formerly manager of market development for Crosley and Bendix Home Appliances Div., Avco Mfg. Corp., Cincinnati, has been named general manager of the company's new factory distribution branch in Chicago.

## PREDICT NEW HIGH FOR '55 STEEL KITCHEN SALES

Arthur J. Tuscany, Jr., executive secretary, the Steel Kitchen Cabinet Manufacturers Association, Cleveland, announces that 1955 unit sales of steel kitchens are expected to reach a total of 4,046,000, an increase of 674,000 over the 1954 total, and dollar volume will reach \$35 million over the 1954 total.

## NORGE 10-MONTH SALES PASS \$100,000,000 MARK

Sales of Norge Div., Borg-Warner Corp., Chicago, exceeded \$100,000,000 in the first 10 months of 1955, the first time in history they have reached that figure in any one year, Judson S. Sayre, president, reported.

November sales were 101% ahead of sales for November, 1954.

## CENTRAL HEATING UNIT SHIPMENTS SET RECORDS

Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association, has reported that gas-fired warm air furnace shipments to dealers and distributors reached 92,800 units during October, 17.5% over last year and the highest October figure on record.

## ADMIRAL SALES FIGURES

Third quarter sales of \$52,772,916 compared with \$51,265,777 last year were reported by John B. Huarisa, executive vice president of Admiral Corp., Chicago.

## GAS RANGE SHIPMENTS UP IN NOVEMBER

Edward R. Martin, Gas Appliance Manufacturers director of marketing and statistics, reported that during November 182,000 gas range units were shipped to dealers and distributors, compared to 174,000 shipped during November 1954, an increase of 4.6%.

## VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in October were 33.2% higher than the same month in 1954, and were greater than September, 1955, sales by 13.7%, according to the Vacuum Cleaner Manufacturers Association.

## NEW DITTO PLANT

Ditto, Inc. is constructing a \$3,400,000 plant in Lincolnwood, Ill., Chicago suburb.

## MULLINS MFG. PLANS MERGER WITH AMERICAN RADIATOR

Mullins Mfg. Corp., Warren, Ohio, plans to merge with American Radiator and Standard Sanitary Corp., if stockholders vote approval. Terms of the agreement call for Mullins to become the Youngstown Kitchens Div. of American-Standard.

## NAME WHIRLPOOL-SEEGER PRODUCT MANAGERS

The appointments of Sol Goldin and Karl R. Hake, Jr. as product manager and assistant product manager, respectively, for the range division of Whirlpool-Seeber Corp., St. Joseph, Mich., were announced by John W. Craig, vice president.

## SARGENT HEADS WESTINGHOUSE MAJOR APPLIANCE DIVISION

Announcement has been made of the appointment of R. J. Sargent as general manager of the Westinghouse major appliance division.

## Institute of appliance manufacturers — conference (Continued from Page 9)



Typical "floor session" at the IAM meeting.

On Tuesday afternoon there was a session on built-in appliances which featured Howard Ketcham, Howard Ketcham, Inc., speaking on "Color in the kitchen", (see a feature by Mr. Ketcham starting on page 22, this issue), and Paul Vignos, chief engineer, Berger Division, Republic Steel Corporation, speaking on "A study of dimensions of built-in appliances and cabinets." Mr. Ketcham pointed out what has been and can be done with color. He stated that the appliance industry could and should standardize color in appliances and kitchens in general. Mr. Vignos stressed the fact that the appliance industry needs to standardize the dimensions of their units.

## NEWS

### A. O. SMITH NAMES CORNELL EXECUTIVE VP & DIRECTOR

F. S. Cornell, formerly vice president and general manager, has been elected executive vice president and a director of the A. O. Smith Corp., Milwaukee.

### DEIG IS SERVEL MFG. MGR.

Carl E. Deig has been promoted to manufacturing manager in the home appliance division of Servel, Inc., according to John H. Wall, vice president and general manager of the division.

### HUPP MERGES WITH TYPHOON PROP-R-TEMP

The merger of Typhoon Prop-R-Temp, Tampa, Florida, with The Hupp Corp., Detroit, has been announced by E. L. Garfield, Typhoon president.

### AMANA FREEZER SALES UP

J. A. Rishel, general sales manager, Amana Refrigeration, Inc., Amana, Iowa, announced that 25% more warranty cards were received from freezer purchasers in October 1955 than in October 1954.

### R. HOE FORMS CONTRACT MANUFACTURING DIVISION

R. Hoe & Co., Inc., Bronx, N. Y., maker of giant printing presses, announced that it has established a contract manufacturing division.

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## GAS WATER HEATER

### SHIPMENT FIGURES

Shipments of gas water heaters in October totaled 232,800 units, 15.2% over the same month in 1954, according to Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association.

## RHEEM AND RICHMOND

### RADIATOR PLAN MERGER

Rheem Mfg. Co., New York City, has announced plans to merge with Richmond Radiator Co., manufacturer of plumbing fixtures, if stockholders of both companies vote approval.

According to R. S. Rheem, president of Rheem, Richmond will be maintained as a separate operating division of Rheem under the continued direction of John J. Hall, president. No basic changes in Richmond's organization or general operating policies are planned.

Rheem estimates its 1955 sales at more than \$160,000,000, and Richmond estimates sales for the year at \$20,000,000.

## BUDDENBERG LEAVES NHMA POST

The resignation of A. W. Buddenberg as executive secretary of the National Housewares Manufacturers Association has been accepted by the board of directors. Dolph Zapfel was elected to succeed him.

## MIDWEST ENAMELERS MEET

The Midwest Enameler's Club meeting was held December 3 at the La Salle Hotel in Chicago. Dr. R. C. Gibson, Parker Rust-Proof Co., discussed "Pre-Namel 410 Process", and W. B. Anderson, Titanium Pigment Corp., showed the film, "The 9th Element".

Of the 127 in attendance, approximately 25 were from the American Ceramic Society.

The next meeting will be held January 27. It will include lunch at the Graemere Hotel and a tour of the Hotpoint home laundry plant.

There are now 130 members signed up for the current year.

## COREY IS NEMA PRESIDENT

J. W. Corey, president, The Reliance Electric & Engineering Co., Cleveland, was elected president of the National Electrical Manufacturers Association at the 29th annual meeting November 14-18.

Vice presidents are F. F. Loock, president, Allen-Bradley Co., Milwaukee; J. J. Mullen, Jr., president, Moloney Electric Co., St. Louis; B. C. Neece, president, Landers, Frary & Clark, New Britain, Conn.; W. V. O'Brien, vice president and general manager, Apparatus Sales, General Electric Co., New York; J. L. Singleton, vice president, Industries Group, Allis-Chalmers Mfg. Co., Milwaukee.

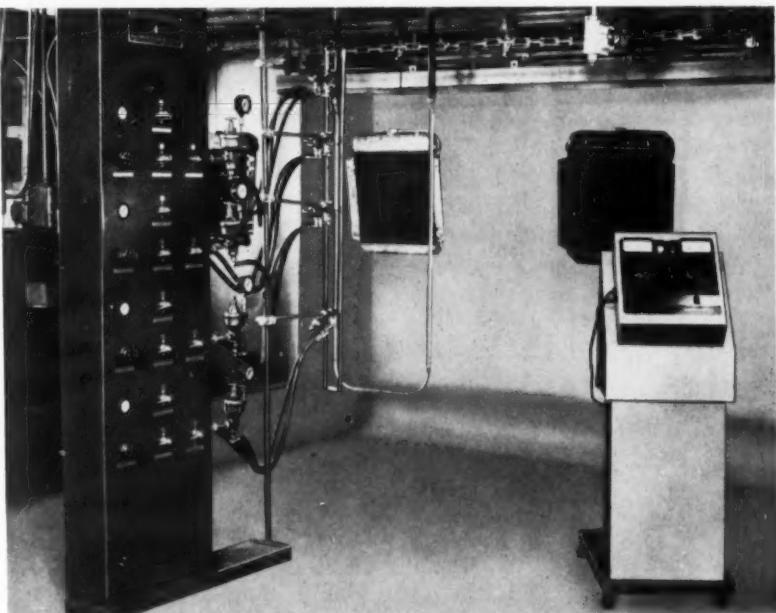
Treasurer is Arthur A. Berard, president, Ward Leonard Electric Co., Mount Vernon, N. Y.

## NEW GAMA MEMBERS

According to Harold Massey, managing director, Gas Appliance Manufacturers Association, the following companies have been added to the membership list: Guillermo G. Heineken, Buenos Aires, Argentina; Ensign Ribbon Burners, Inc., Pelham Manor, N. Y. and D. P. Ran Corp., Compton, Calif.

Wheelco Instruments Div. of the Barber-Colman Co., Rockford, Ill., has been elected to membership in the Industrial Gas Equipment Division.

to Page 124 →



## Ashdee Automatic Electrostatic Finishing Systems Will Cut Your Painting Costs

More and more manufacturers with metal part finishing operations are turning to the advantages of Ashdee electrostatic finishing. With the Ashdee System, paint particles are attracted to the product by a high voltage electrostatic field that drastically reduces paint waste, eliminates manual spraying, gives faster production speeds and higher quality.

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## Supplies and Equipment

### A-10. Porcelain enameled aluminum foil for laminating

**New** Porcelain enamel in a wide range of matte and glossy colors on 50" wide aluminum now available in 500' coils has been announced. The new material is offered as suitable for individual or continuous lamination to all kinds of backing materials. Foil as thin as .0005" has been successfully processed in this manner. This novel product makes it possible to convert low-cost backing material such as plywood, pressed wood, fibre-, asbestos-, gypsum-board, etc., into a decorative material of construction. Suggested applications include wallboards, ceiling tiles, sink and counter tops, cabinet fronts, door panels, etc.

### A-11. Industrial floor protection

**New** A new method of protecting concrete, bituminous, mastic or other industrial floors against acids, water and cutting oil damage is announced. It consists of applying a seal coat of proprietary liquid over the exposed floors, according to the manufacturer. This can be accomplished by either brush, spray or squeegee at the rate of one gallon per 100 sq. ft. While two coats are said to give adequate protection, three applications are recommended in extreme cases.

### A-12. New series of press brakes

**New** Four new series of press brakes for bending and forming sheet metal and steel plate incorporate the following features: all-steel, welded frame and deep section bed and ram of rolled steel plate; a double-end drive from the intermediate shaft; one-piece main gear and eccentric at each end which rotate on hardened alloy steel shafts; a plus-duty Twin Disc friction clutch and band brake on flywheel shaft;

#### More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form 119 or write to us on your company stationery.

and a split ram adjustment. All gears are precision cut steel and enclosed. The clutch can be jogged or slipped to meet operating conditions. Optional features are available to meet special requirements.

### A-14. Cold chemical finisher for aluminum

**New** A new cold chemical finisher has been perfected for aluminum coating. It gives a soft or high gloss finish immediately upon application, one minute is required

for drying. The surface tension is very low, which means it can be dipped, sprayed or applied with a rag or brush. There is no surface spotting or density variation. Principle use, as suggested by the manufacturer, is in retouching and for the fabrication of small parts.

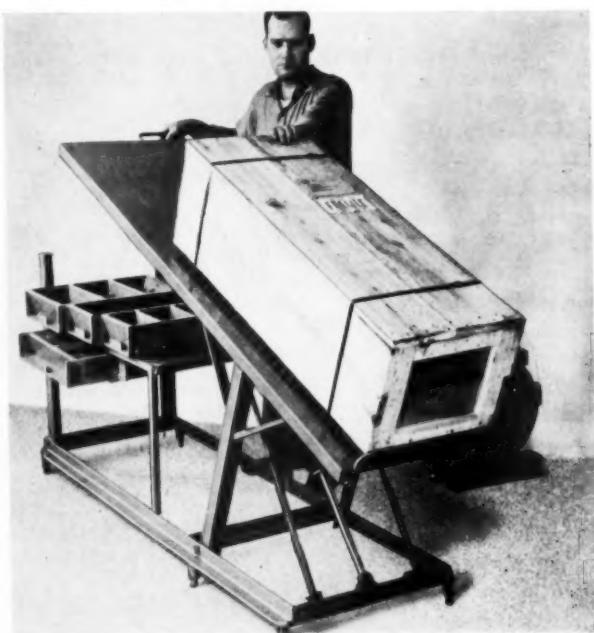
### A-15. 100°F to 1000°F oven

**New** An oven is offered that was especially designed and built to meet the needs of industry for operations that require an oven with adjustable temperature control from 100°F. to 1000°F. Construction is all steel — a cabinet within a cabinet — with 5" of Rockwool insulation. Gas burners at the bottom of the oven supply the heat.

### A-13. Hydraulically controlled packing bench

**New** A new hydraulically controlled packing bench, the Hydra-Tilt table, can be tilted to set boxes weighing up to 1000 lbs. on the

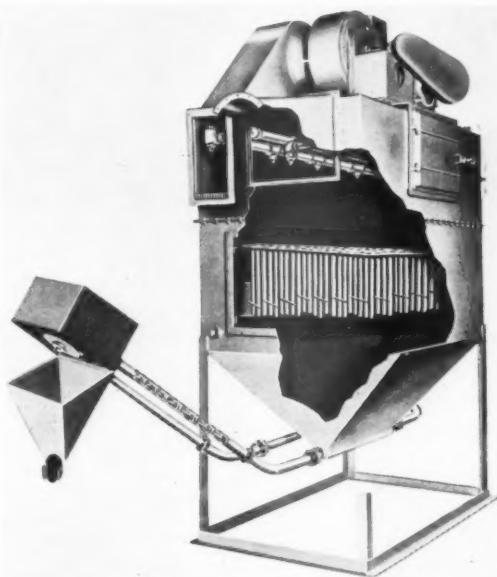
floor after they have been packed. It is said to have a hydraulic cylinder incorporated in its design that allows the operator to automatically tip the load from table to floor by a control lever. Heavy pieces of equipment can be placed on the table by use of a monorail and hoist and then be boxed at convenient working height and tilted to the floor so that they can be trucked away. It is claimed that time can be saved with this packing table, as a single operator can move heavy loads. Safety is another feature.



#### A-16. Scrubber removes low micron dust fumes and odors from exhaust

**New** A special new dust control, a hydro precipitator scrubber, has been developed that is said

to remove microscopic solids, fumes and odors from exhaust gases at 99% efficiency. It is designed for use anywhere impurities are encountered of extremely low and even sub-micron size particles.



#### A-17. "U" type quartz immersion heater

**New** A new type electric radiant translucent fused quartz immersion heater has been designed to solve the problems encountered in the heating of acid electroplating and pickling solutions. Greater accuracy in controlling bath temperatures is said to be possible with the new immersion heater when used with a thermostat, because of freedom from thermal lag between thermostat and heater.

til used. Numbers and letters can be applied in seconds and are designed to stick permanently to any clean, dry surface.

#### A-19. Resistor engineering guide

**New** Comprehensive data on a complete line of resistors and special products is listed in the revised 1955-1956 Official Resistor

Engineering Guide. Data given includes JAN or MIL equivalent, rated wattage, standard tolerances, temperature rise, temperature coefficient, maximum operating temperature, ohmic values available, dimensions and approximate prices.

#### A-20. Time recorder totalizer

**New** A new brochure describes the Time Recorder—Totalizer, which is designed to provide a continuous operation record of any electrically operated machine or process. Chronologically marked tape from a large roll continuously passes through the instrument recording the time and length of every "on" and "off" period of the equipment. It is said to increase the efficiency of office procedure, plant and production control and cost analysis.

#### A-21. Controlled air power devices

**New** Bulletin ML-3 illustrates and describes the complete line of "Controlled-Air-Power" devices. This 8-page booklet contains full color illustrations of an air motor and its interchangeable valves as well as various typical application photos. It also contains illustrations and descriptions of such standard items as drill press feeds, vises, hydro-checks, rotary feed and index tables, self contained drilling units, valves and cylinders, in the complete line of packaged "Controlled-Air-Power" Devices.

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Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Company Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

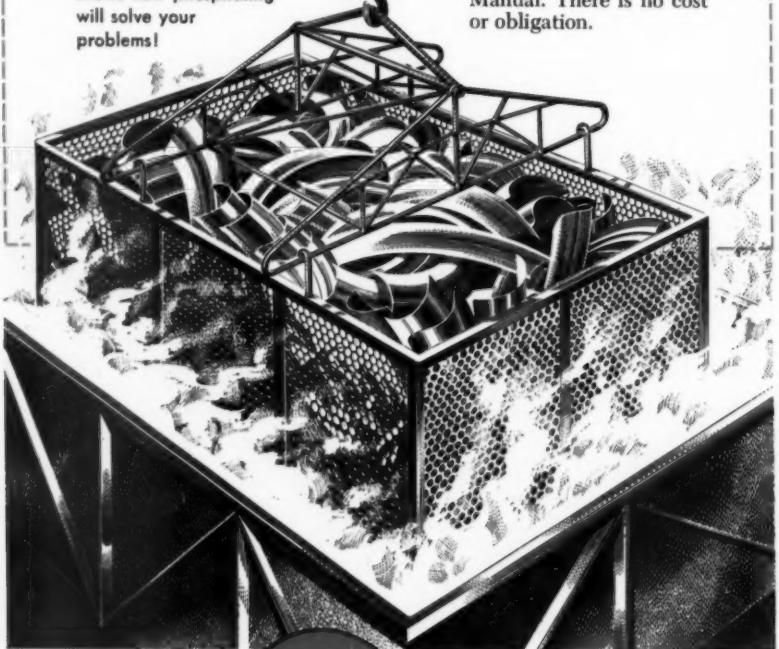
# poor paint adhesion?



**FREE MANUAL**  
shows how phosphating  
will solve your  
problems!

If poor paint adhesion is your problem, chances are you'll find the solution in the Turcoat Phosphating Manual. This booklet describes the complete Turcoat line, tells the full story of phosphating and includes a valuable "Phosphating Reference Chart," which quickly gives the answer to any paint adhesion problem.

If you are interested in permanent paint adhesion, write today for the Turcoat Manual. There is no cost or obligation.



Offices in all principal cities



**TURCO PRODUCTS, INC.**  
Chemical Processing Compounds  
6135 So. Central Ave., Los Angeles 1, Calif.  
Factories: Newark, Chicago, Houston, Los Angeles



You will be assured of a permanent paint seal, simply by using Throcoat as a bond for organic finishing.

Please affix coupon to company letterhead

**TURCO PRODUCTS, INC.**  
6135 So. Central Ave., Los Angeles 1, Calif.  
Please send me a copy of the Turcoat Manual  
without cost or obligation.

Name \_\_\_\_\_

Title \_\_\_\_\_ F

## COLOR . . vital impact

→ from Page 23

sentatives available everywhere in this country and specialized telephone techniques also used, it is now possible to determine the color response of any number of individuals for any product in any price range. And all of this can be done in a relatively short time at a relatively low cost. The exactness of results is assured by the use of specially prepared equipment which presents the correctly chosen colors in controlled test areas. It has been my experience that polls properly planned and interpreted are often incredibly correct and beneficial in competition.

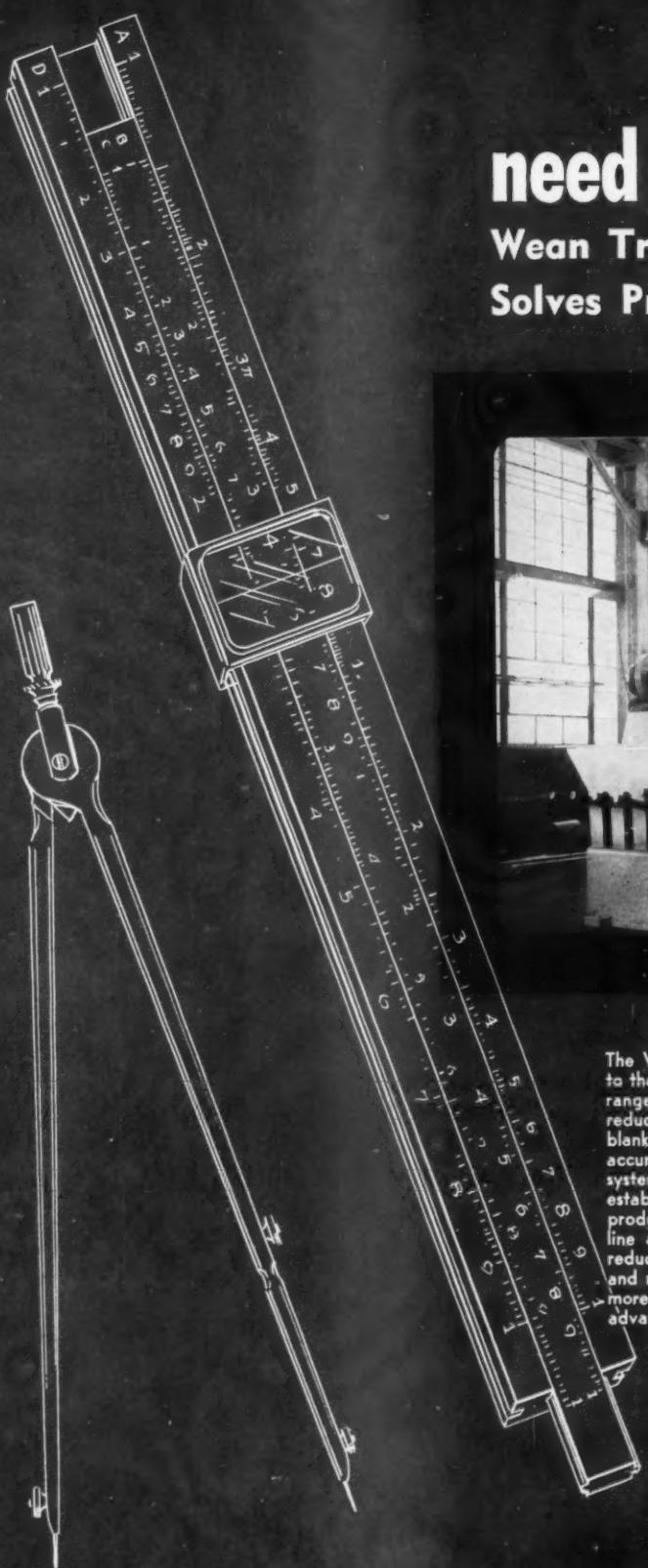
There is a decided sales insurance to be had from information that predetermines promptly which of any colors under consideration are likely to sell — and in which sections they will sell best. These are the kind of facts that invariably save every manufacturer money . . .

Knowing to what colors the public is most susceptible, a manufacturer can maintain smaller inventories by confining patterns and designs to the most salable ones. Through constant analysis of what colors the public has favored and is favoring, it is possible to be informed of color-style trends in advance of competition products . . .

The builder of a colored product today must consider the total impression of the product on the customer. That is to say, an impression compounded of the producer's corporate identity, as established by his letterhead and bill forms; the appearance of his building; the tone of his reception rooms; the container and label in which his product is presented; the impact of its advertising; and even the appearance of the truck that carries the product to the market place. When all of these are coordinated in colors that are sound and in keeping with the laws of good coloration, the total impact makes powerful sales insurance for your product.

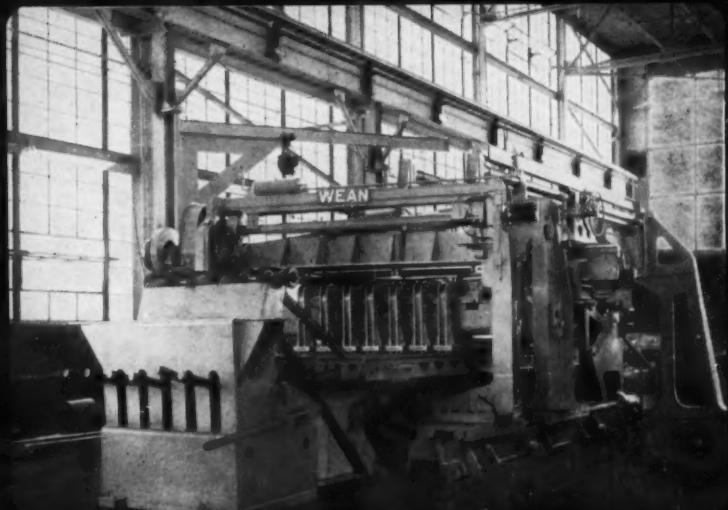
It is not profitable to sell Anna Held colors in the Marilyn Monroe era.

adapted for *finish* from presentations before the Porcelain Enamel Institute and the Institute of Appliance Manufacturers.

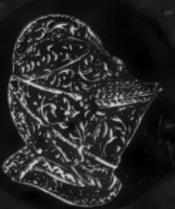


# need an idea?

## Wean Trapezoidal Shear Line Solves Problem for Auto Maker



The Wean Trapezoidal Shear Line was developed as an answer to the high speed blanking of irregularly shaped pieces in the broad range that can be described as trapezoids or parallelograms. This use reduces tremendously the cost of expensive die setup in major blanking presses. Two pieces are made at each index with the accuracy that can only be achieved by a measured length indexing system. The cut can range from 45° to 90° angles. The latter setting establishes the line as a straight cut-up unit with twice the normal production of conventional shear lines. At Wean, we consider this line as another important step forward in our policy of cost reduction through progressive engineering. People in the automotive and metal fabricating fields have come to look more and more toward Wean Equipment for spectacular advances in machinery for metal processing.



# Wean

EQUIPMENT CORPORATION  
CLEVELAND, OHIO

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Cable: WEANCOR

# NEWS about Suppliers

## SIGNODE APPOINTS BECKMAN

Signode Steel Strapping Co., Chicago, has announced the appointment of Joseph F. Beckman to the position of assistant director of sales and manager of steel industry sales.

## NEW NATIONAL LOCK PLANT

National Lock Co., Rockford, Ill., has announced the construction of a one-story \$5,000,000 factory on the outskirts of Rockford.

## MCLARY IS BORG-WARNER VP

The election of M. R. McLary as vice president of the Ingersoll Products Div., Borg-Warner Corp., Chicago, was announced by J. H. Ingersoll, division president. Robert F. Schutz has been named vice president and manager of the Ingersoll Kalamazoo Div.

## BLESSING IS DOW CORNING VP

Olin D. Blessing, sales manager of Dow Corning Corp., Midland, Mich.,

has been named a vice president, it was announced by Dr. W. R. Collings, president.

## CLARK NAMED PENNSALT VP

Lee H. Clark has been named vice president of Pennsylvania Salt Mfg. Co., Philadelphia, president William P. Drake announced.

## ROBERT LOVE HEADS

### WATKINS GROUP

The Watkins Container Association has announced the election of Robert D. Love, president of Love Mfg., Inc., as president for 1956.

## PITTSBURGH PLATE NAMES PAINT SALES ASSISTANT

Pittsburgh Plate Glass Co., Pa., has announced the appointment of Albert Bauzenberger, Jr., as assistant manager of industrial sales for the Philadelphia district.

## VITRO VP AND DIRECTOR

Albert G. Noble, Admiral USN, Ret., has been elected a vice president and director of Vitro Corp. of America, according to J. Carlton Ward, Jr., president.

## FOOTE CHAIRMAN RETIRES

H. C. Meyer, chairman of the board of Foote Mineral Co., Philadelphia, has announced his retirement after fifty years of service to the company.

## TURCO ASSISTANT SALES MGR.

Appointment of Joseph Horacek, Jr., as assistant sales manager has been announced by President S. G. Thornbury of Turco Products, Inc., Los Angeles.

## HOULE TO ATLAS PLYWOOD

Georges L. Houle has been appointed chief of staff of Atlas Plywood Corp., according to Robert A. Muller, president.

## PYRAMID PLANT ADDITION

Pyramid Mouldings, Inc., Chicago, has announced the construction of a large plant addition which will increase plant facilities by over 50%.

## PROMAT'S DR. CHESTER DIES

Dr. A. E. Chester, vice president of Promat Div., Poor & Co., Waukegan, Ill., died on November 20, 1955.

## ILLIAN HEADS TUTTLE & KIFT RESEARCH

John A. Sullivan, president, Tuttle & Kift, Inc., Chicago, has announced the appointment of Douglas F. Illian as director of research and development for all plants and products.

## WILDERN IS ROBERTS BRASS VP

The Roberts Brass Mfg. Co., Mitchell, Ind., has announced the appointment of Wm. J. Wildren, formerly with Detroit Brass & Malleable, as a vice president.

## FERRO EXPANSION PLANS

A new \$250,000 building and equipment expansion has been announced by C. D. Clawson, president of Ferro Corp., Cleveland. The program will take place in the Color Div. and will increase laboratory and manufacturing areas to over 60,000,000 sq. ft.

## SORENG UPS BECKER

George D. Becker has been appointed executive vice president of Soreng Products Corp., Schiller Park, Ill., announced Louis Putze, president. Frederick Morawetz has been named manager of research and development in the Central Engineering Div., and Paul F. Neess has been appointed sales manager of heating and air conditioning controls.

## FRANK IS AMERICAN AIR FILTER PRESIDENT

W. G. Frank, formerly executive vice president, has been named president of the American Air Filter Co., Louisville, Ky., and W. M. Reed has been elevated from president to chairman of the board.

## ANDERSON BRASS BUYS DETROIT BRASS DIVISION

R. C. Anderson, president, Anderson Brass Co., Detroit, has announced the acquisition of certain assets of the Brass Div. of Detroit Brass and Malleable Co. The new assets will be used to form the nucleus of a new company known as Detroit Valve Co., operated as a wholly owned division of Anderson Brass.



**Universal Screw plant** — now under construction, will be ready for occupancy in August, 1956. This is an artist's conception of the 60,000' Chicago plant which is expected to double production facilities and provide space for expansion.



## Expand enameling volume with Du Pont Porcelain Enamel for Aluminum

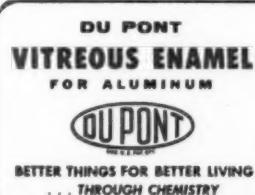
This protective and decorative Du Pont finish for aluminum offers many important features and advantages.

Lifetime finishes of Du Pont porcelain enamel resist abrasion, thermal shock, impact and flexing . . . can be sawed, sheared, drilled and punched without spalling.

And these rugged coatings add rigidity to

aluminum sheet, allowing you to use lighter gauge aluminum and cut packaging and shipping costs.

**FOR MORE INFORMATION** on how you can expand your enameling volume and increase customer satisfaction by adding aluminum enamels to your line of finishing service, mail the coupon below.



### MAIL THIS COUPON TODAY

E. I. du Pont de Nemours & Co. (Inc.)  
Electrochemicals Dept. F-1, Wilmington 98, Del.

Please send me a copy of your free booklet on Du Pont Porcelain Enamel for Aluminum.

Name \_\_\_\_\_ Position \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

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*"I saw your ad in finish"*

## CLASSIFIED ADVERTISING

### FOR SALE

### FOR SALE COMPLETE LARGE SCALE PAINT INSTALLATION

Complete system with double deck oven, two conveyor lines for mass production painting. Ideal for automotive or metal parts finishing. Complete system for sale — includes:

1. Cleaning system with two hot rinse and phosphating sections, cold water rinse section and chromic acid rinse section. One drying oven with oil fired Ross furnace.

2. Three 18-foot water wash spray booths.

3. Two conveyor lines for continuous production.

4. One double deck oven for prime and finish coats, each with its own separate recirculating air heating system and separate Ross fired furnace.

Designed and installed by Despatch Oven Company — new in 1948. Send for photos and complete details. Write Box 156, c/o *finish*, York St. at Park Ave., Elmhurst, Ill.

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### NEMA PREDICTIONS FOR 1956

According to Joseph F. Miller, managing director, and A. J. Nesti, chief statistician, National Electrical Manufacturers Association, the electrical manufacturing industry in 1956 expects to surpass the output of 1955 by 7½%, with total industry output reaching \$18.7 billion.

### GAS WATER HEATER SHIPMENTS

Shipments of automatic gas water heaters in eleven months of 1955 reached 2,559,800 units, 21.1% over last year according to Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Assn.

### VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in October were 33.2% higher than the same month in 1954, according to the Vacuum Cleaner Manufacturers Association.

[See statistical information in February]